# Orthopaedics

## Version 5.3

Corrected, Updated, Lighter

**PLAB 1 Keys is for PLAB-1 and UKMLA-AKT (Based on the New MLA Content-Map)**

**With the Most Recent Recalls and the UK Guidelines**

**ATTENTION: This file will be updated online on our website frequently!**

**(example: Version 2.2 is more recent than Version 2.1, and so on)**

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| Key 1 | **Slipped Upper Femoral Epiphysis (SUFE)** |
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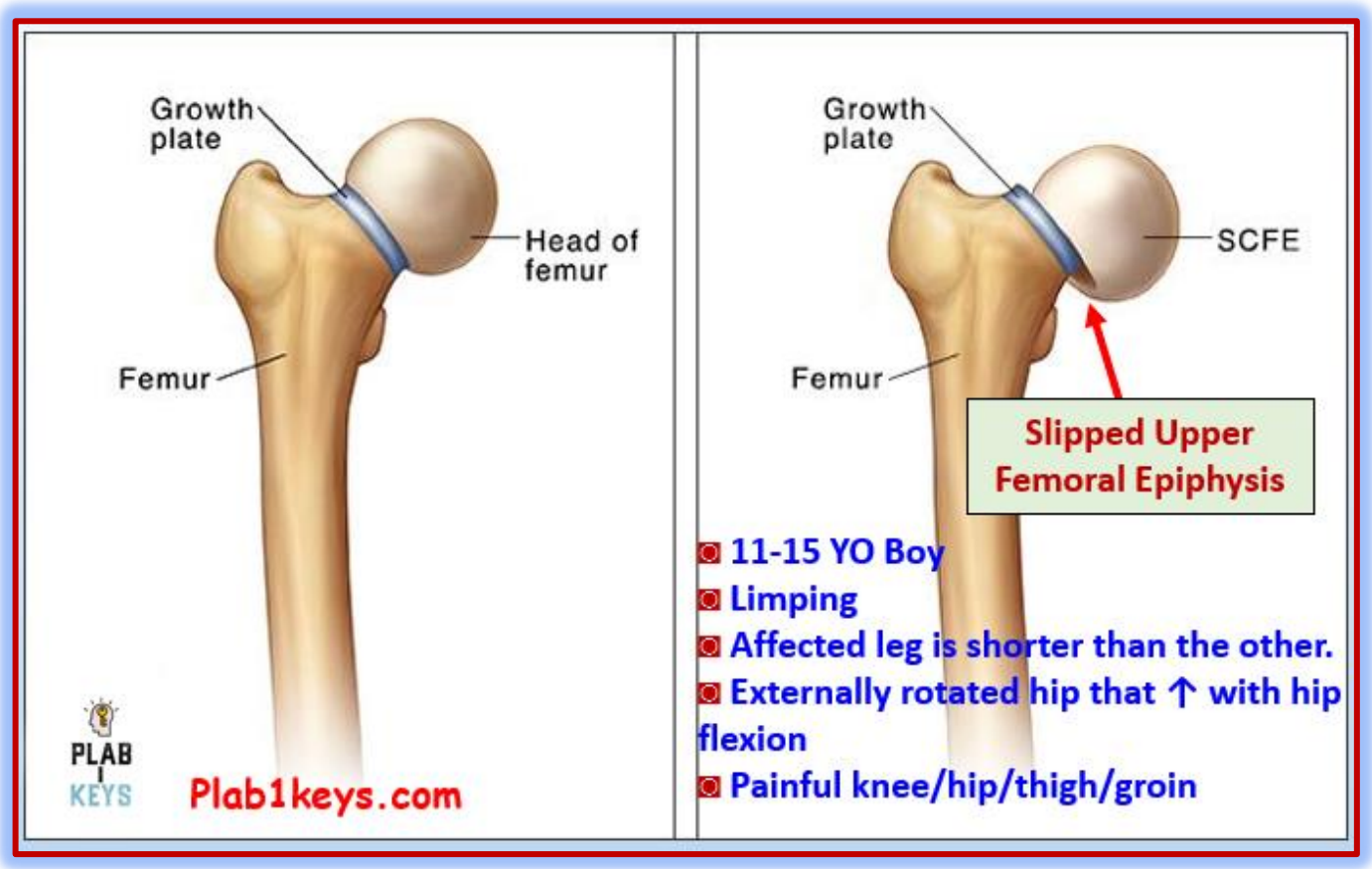
- 11-15 YO Boy
- Limping
- The affected leg is shorter than the other

- Externally rotated hip that ↑ with hip flexion
- Painful knee/ hip/ thigh/ groin
- Limited hip abduction.



Key 2

## On Foot bone Fractures:

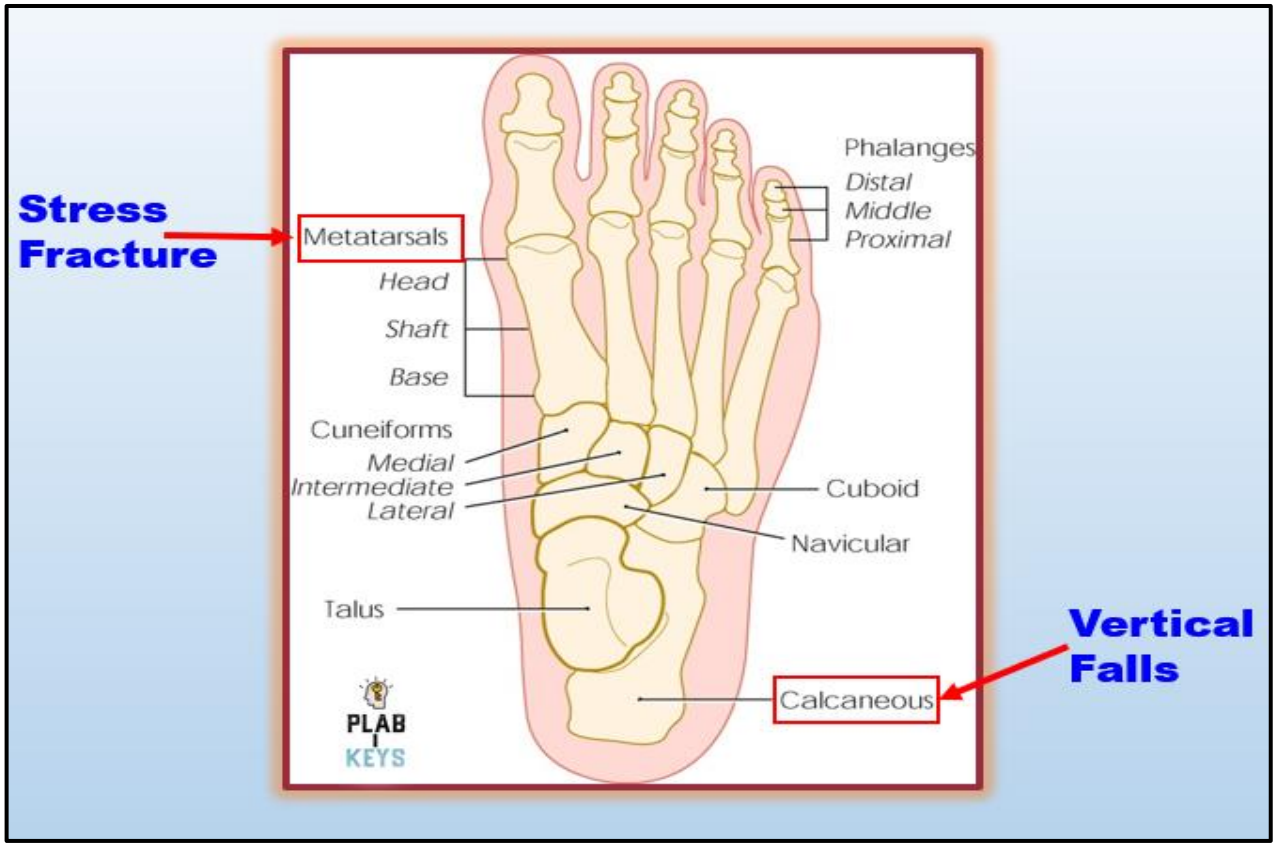
◙ Falling "**Vertically**" on feet, the likely foot bone to fracture

→ **Calcaneus**.

(Also check for spinal Fracturs as they are also common in vertical falls)

◙ **Stress** Fracture of Foot, the likely affected bones

→ **Metatarsals**.



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| Key 3 | **Bone pain** (e.g. in a long bone such as a leg) especially in young people that is unrelated to activity and responds quickly to NSAIDs (e.g. Aspirin)<br><br>→ **Osteoid Osteoma**. "benign long bones tumour e.g. femur, tibia" |
| Key 4 | **Sensory Loss Responsible Nerve Roots**<br><br>*3 in the thigh ▌2 in the shin ▌1 in the foot*<br><br>• Groin and pelvic Girdle → **L1**<br>• Anterior thigh → **L2**<br>• Inner (Medial) thigh and distal anterior thigh → **L3**<br><br>• Inner (medial) shin → **L4**<br><br>• Outer (Lateral) shin and **Dorsum of the foot** → **L5** |

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| | • Lateral Foot → **S1** |
| Key 5 | **Prostate cancer can metastasise to spine causing**<br><br>→ **Cauda Equina Syndrome**<br><br>→ **Perianal/ groin numbness (Saddle Paraesthesia) ▌Inability to initiate voiding "urination" ▌Back pain**.<br><br>**Cauda Equina Syndrome**<br><br>• Cauda equina = bundle of nerves and nerve roots at the lower end of spinal cord.<br>• It resembles the horse's tail, starts from (T12/L1 to Coccyx).<br>• Compression of the cauda equina is a surgical emergency!<br><br>• **Features:**<br>♦ **Sciatica** (pain along the sciatic nerve course **Low back**, hips, buttocks, legs).<br>♦ **Saddle Paraesthesia** (anal/ perianal/ groin numbness). |

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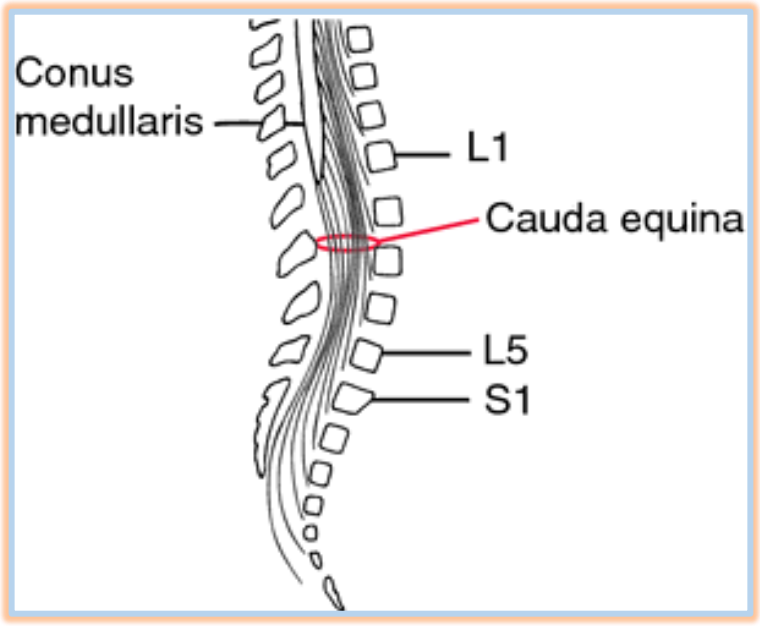
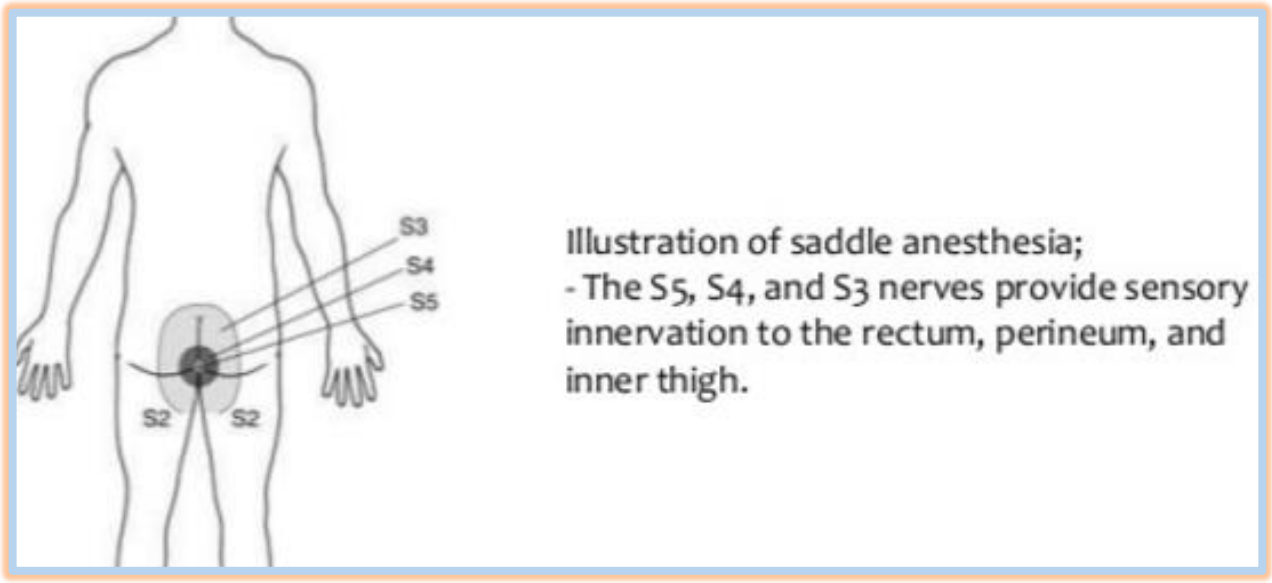
| | ♦ **Urinary retention** (inability to void).<br><br>♦ **Fecal incontinence** (inability to control bowel movements, resulting in involuntary soiling).<br><br>• The commonest cause → ***Central Disc Prolapse*** that compresses cauda equina.<br><br>• It is a surgical emergency<br><br>• **Urgent MRI**<br><br>• Sometimes the answer would be → **Urgent referral to orthopaedic surgeon**.<br><br>• **Urgent Surgical decompression**<br><br>(To avoid persistent loss of sphincter and motor functions). |




In a patient with lower back pain, the presence of (**Saddle Paraesthesia**) warrants urgent **referral to neurosurgical/ orthopaedic team** for **MRI**.

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| Key 6 | **Lumbosacral Disc Herniation/ Disc Prolapse** |

◙ **Features**:

√ **Severe lower back pain that radiates to a leg (could be Acute sudden onset)**

√ Lying supine with legs raised → ↑ pain (+ve straight leg raising test)

√ When getting up from a lying positing → ↑ Pain.

√ Walking/ Prolonged sitting → ↑ Pain

√ **Lying down → relieves (↓) pain**.

√ ± Nerve entrapment → Sciatica → shooting, electric shock pain moving down a leg (leg pain > back pain). "Back pain radiates to a lower limb"

♦ **Next step** → Reassure and prescribe analgesics

♦ **If any red-flags or this option is not given** → MRI Spine

See below

◙ **Management**:

♦ If not severe, it usually resolves in 6 weeks to a few months.

♦ **NSAIDs** are preferred "for **pain** relief". "*Describe PPI with it*".

♦ If there is **sciatica** → ***Amitriptyline*** "preferred", **Gabapentin**, **Pregabalin**.

♦ **Important**: If associated with Saddle Paraesthesia (anal/ perianal/ groin numbness), Fecal incontinence, urinary retention → suspect **cauda equina syndrome** and refer urgently to **orthopaedics** for **MRI**.

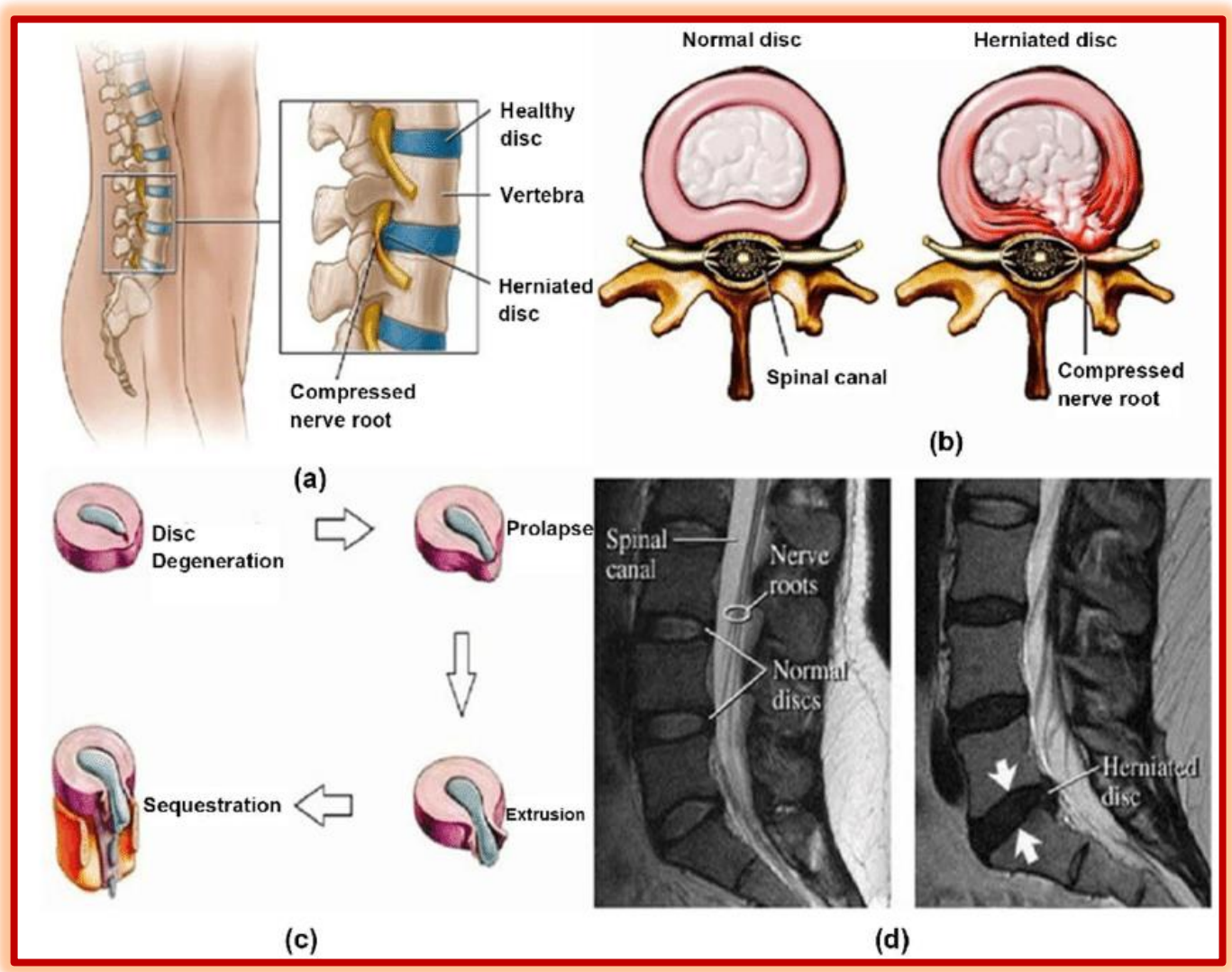
◙ **Notes**:

(♣) Intervertebral disc:

√ **Herniated** disc is more common in people **< 40** YO.

√ **Degenerative** disc is more common in people **> 40** YO.

(♣) The commonest site is (**L5/S1** followed by **L4/L5**).



**Example 1**,

A 22 YO male presents complaining of a sudden onset severe lower back pain which was elicited when trying to get up. The pain ↑ in intensity when lying down with legs being raised. There is also a tense electric shock like pain radiates down to his left leg.

The likely Dx → **Lumbosacral disc herniation**.

### ◙ Clinchers

→ +ve straight leg raising test (**+**) back pain with a lower limb radiation.

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**Example 2**,

A 35 YO male presents complaining of back pain which started 2 days ago when he was moving to a new house. The pain radiates to his left foot and increases in severity when he coughs. O/E: +ve straight leg raising test, loss of deep tendon reflexes of his left leg, Sensory loss over the anterior knee.

The likely Dx → **Intervertebral Disc Prolapse**.

### ◙ Clincher

→ +ve straight leg raising test (**+**) back pain with a lower limb radiation.

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| | **Note**, this cannot be a (L5 nerve root compression). Remember, this patient's deep tendon reflexes are lost on the affected leg. Knee reflex (L3, L4) has nothing to do with L5! |
| Key 7 | **Repetitive "overhead" "above the shoulder" activities**. Examples:<br>♠ Volleyball – Tennis – Badminton player, Swimmer.<br>♠ Carrying heavy objects (e.g. a recent move to a new house).<br><br>(+)<br><br>**Shoulder weakness, Pain especially on raising arm above shoulder** and at night<br><br>Thick of → **Supraspinatus Tendinitis**. |
| Key 8 | √ **The elderly people with osteoporosis are vulnerable to bone fractures following a trivial fall or trauma.**<br><br>**An elderly** + **Hx of fall** + **Painful hip** + **Shortened, Externally rotated leg** |

→ Suspect **Fracture of the Neck of the Femur**. (**neck**, not head of the femur)!

◘ We can suspect an elderly of being at a risk of Osteoporosis or already has Osteoporosis if he/ she is taking Bisphosphonates (e.g. Alendronate).

◘ **Alendronate** is first-line management of Osteoporosis.

◘ Osteoporosis Patients can easily get fractures particularly the **neck of femur**.

♠ **Remember**,

◙ A child "**Boy**" with **limping** ▌shortened leg ▌externally rotated leg

→ **Slipped upper femoral epiphysis**.

◙ A child "**girl**" ▌Breech presentation ▌FHx ▌**Limping** ▌**Painless** leg that is shorter than the other ▌**Unequal skin folds**

→ **Developmental Dysplasia of the Hip (DDH).**

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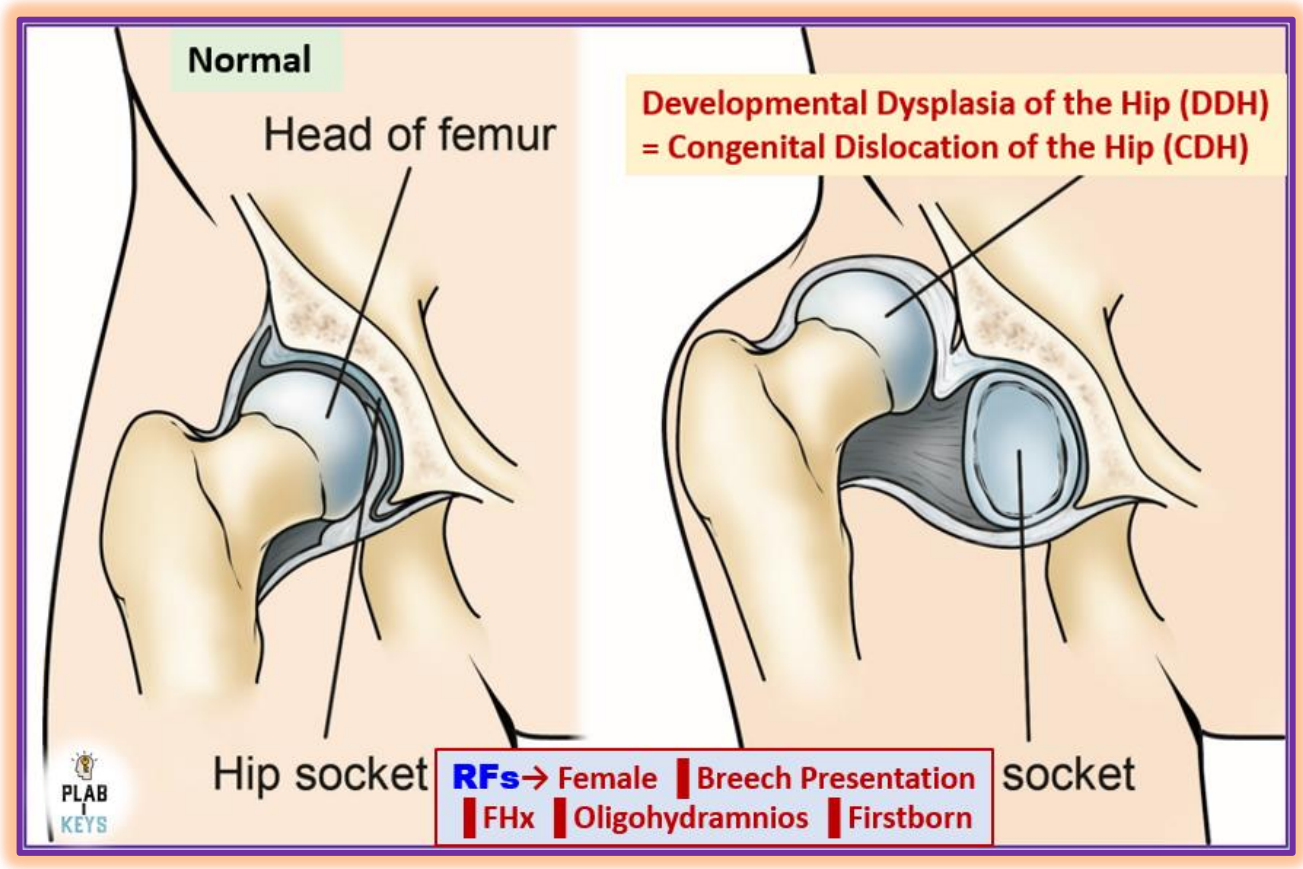
<td> 
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<td>Key 9</td>
<td>One of the commonest fractures 2ry to falling on “outstretched” hand<br><br>→ Scaphoid fracture<br><br>(Painful base of thumb | tender anatomic snuff-box | pronation followed by ulnar deviation produces pain).</td>
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**How to manage?** "important √"

- If X-ray is **+ve**

→ **Scaphoid Cast for 6 weeks**.

- If X-ray is **-ve** "does not show the fracture"

→ **Cast and Repeated X-ray in 2 weeks**.

Key 10

## Developmental Dysplasia of the Hip (DDH)

## A former name: Congenital Dislocation of the Hip (CDH)

### ◙ Risk factors "Important √"

√ Female sex: 6 times greater risk (80%) √

√ Breech presentation √

√ Positive family history √

√ Firstborn children

√ Oligohydramnios √

√ Birth weight > 5 kg

√ Congenital calcaneovalgus foot deformity

DDH is slightly more common in the left hip. Around 20% of cases are bilateral.

◙ **Clinical examination** is made using the Barlow and Ortolani tests:

**Barlow** test: attempts to dislocate an articulated femoral head

**Ortolani** test: attempts to relocate a dislocated femoral head

**Ultrasound** is used to confirm the diagnosis if clinically suspected.

◙ **Management**

♠ Most unstable hips will spontaneously stabilise by 3-6 weeks of age.

♠ **Pavlik harness** (dynamic flexion-abduction orthosis) in children younger than 4-5 months

♠ Older children may require **surgery**

**Note that,**

**√ Slipped Upper Femoral Epiphysis (SUFE) → > in ♂ "males"**

**√ Developmental Dysplasia of the Hip (DDH) → > in ♀ "females, Breech, FHx"**

| | |
|---|---|
| | ◙ A child "**Boy**" with limping ▌shortened leg ▌externally rotated leg ▌**Painful** LL<br>→ **Slipped upper femoral epiphysis**.<br><br>◙ A child "**girl**" ▌Breech presentation ▌FHx ▌Limping ▌**Painless** leg that is shorter than the other ▌Unequal skin fold<br>→ **Developmental Dysplasia of the Hip (DDH).** |
| Key 11 | **Achilles tendon rupture**<br><br>Achilles tendon rupture should be suspected if the person describes the following whilst playing a sport or running; **an audible 'pop' in the ankle**, **sudden onset of significant pain in the calf or ankle** or the inability to walk or continue the sport.<br><br>→ **An acute referral (same-day) to orthopaedics should be made** following a suspected Achilles tendon rupture.<br><br>The affected muscle → **Gastrocnemius**. |

◙ **Diagnosis** → Mainly **clinically** by **Simmond's triad**

Ask the patient to lie prone with their feet over the edge of the bed.

○ Look for an abnormal angle of declination.

○ Feel for a gap in the tendon.

○ Gently squeeze the calf muscles (Thompson Test) → No Plantar flexion (Negative Plantar Flexion), (affected leg remains in a more dorsiflexed position).

**Achilles Tendon Rupture**

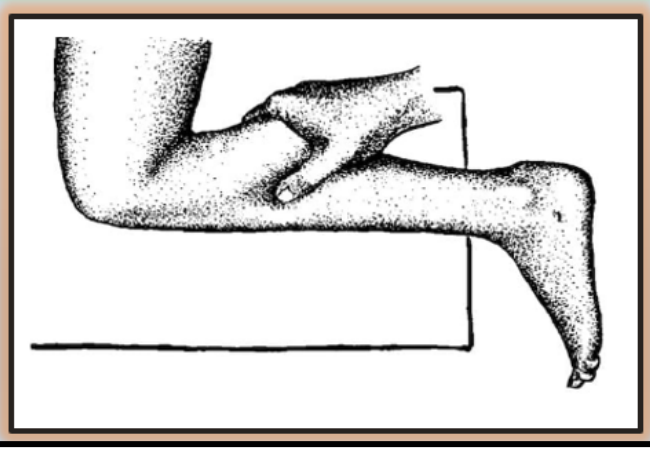
◙ A Sudden "**pop**" **sound** might be heard at the back of a leg whilst playing a sport.

◙ A common description "**Someone has kicked my leg from behind**"

◙ **Calf and Heel Pain**.

◙ On squeezing the calf → **Negative plantar flexion**.

→ **Refer to Orthopaedics**



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**Thompson Test**

**Squeezing the Calf →**
**Absent Plantar Flexion.**

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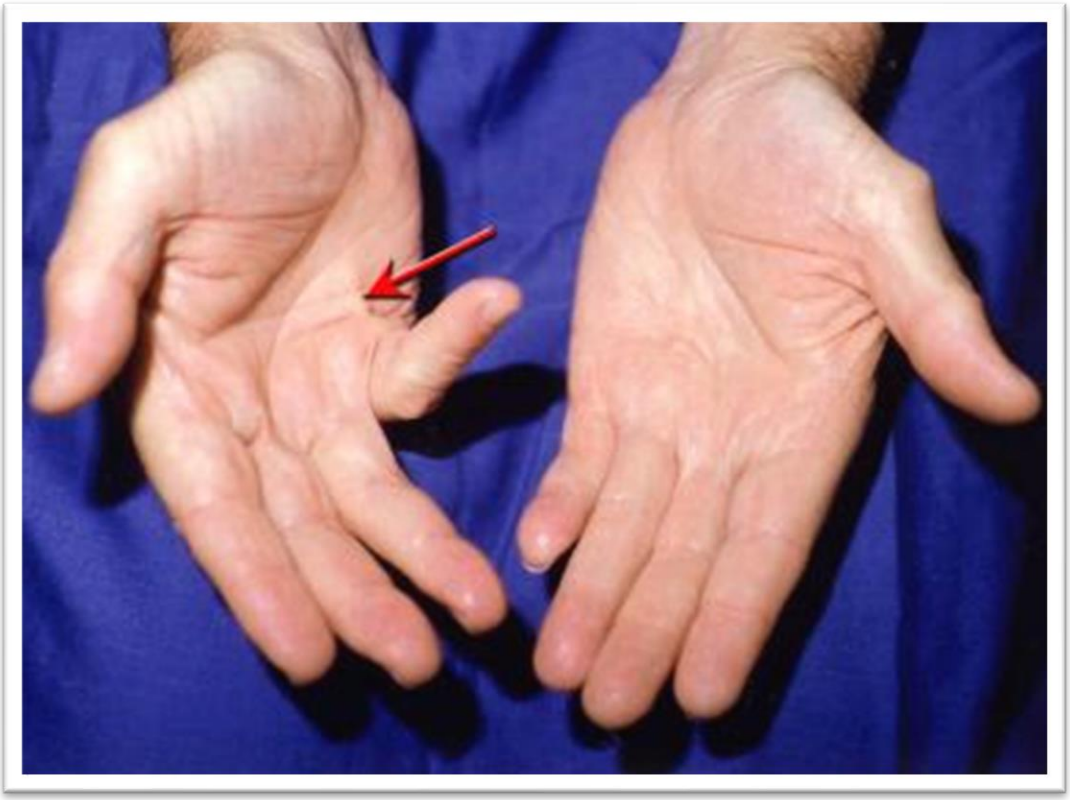
| Key 12 | **Dupuytren's contracture**<br>• a condition in which there is a fixed forward curvature of one or more fingers, caused by the development of a **fibrous connection** between the finger tendons and the skin of the palm.<br>• Dupuytren's contracture has a prevalence of about 5%.<br>• It is more common in older male patients.<br>• 60-70% have a **positive family history**.<br>• **Specific causes include**→ Manual labour ▌phenytoin treatment ▌alcoholic liver disease ▌trauma to the hand ▌DM ▌Smoking<br>• **Mechanism**<br>→ **Formation of thickened fibrous tissue within the palmar fascia**.<br>• **Rx** → **Fasciotomy** |



**Scenario**:

A 38-year old man is unable to extend and straighten his 4th and 5th fingers (ring and little fingers). A firm nodule was found on the distal palmar crease in the same line with the ring finger. His father has a Hx of a similar condition.

The likely diagnosis → **Dupuytren's contracture**.

The likely mechanism

→ **Formation of thickened fibrous tissue within the palmar fascia**.

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| Key 13 | **Trigger Finger** = (**Stenosing Tenosynovitis**) |

◙ More common in the thumb, middle, or ring finger.

◙ **Stiffness of a finger**, and **snapping** (**click**) sound **when extending a flexed digit**.

◙ A nodule may be felt at the base of the affected finger.

Key 14

## Osteoarthritis VS Rheumatoid Arthritis Comparison

| | Osteoarthritis | Rheumatoid Arthritis |
|---|---|---|
| **Causes** | Mechanical – wear & tear<br>• Localised loss of cartilage<br>• Remodelling of adjacent bone<br>• Associated inflammation | Autoimmune |
| **Gender** | **Similar** incidence in men and women | More common in **women** |
| **Age** | Seen most commonly in the elderly | Seen in adults of all ages |
| **Typical affected joints** | Large weight-bearing joints (hip, knee)<br>Carpometacarpal joint<br>DIP, PIP joints | MCP,<br>PIP joints |
| **Typical history** | ◘ Monoarthritis (Hip, Knee, Shoulder)<br>◘ Pain following use (tired joints at the end of the day) | ◘ Involves > 1 joint.<br>◘ Morning stiffness, |

| | | |
|---|---|---|
| | ◘ Improves with rest<br>◘ Unilateral symptoms<br>◘ No systemic upset<br>± Crepitus | ◘ Improves with use<br>◘ Bilateral symptoms<br>◘ Systemic upset |
| **X-ray findings** | **LOSS**<br>♠ **L**oss of joint space<br>♠ **O**steophytes forming at joint margins<br>♠ **S**ubchondral sclerosis<br>♠ **S**ubchondral cysts | ♠ Loss of joint space<br>♠ Juxta-articular ***osteoporosis***<br>♠ Periarticular erosions<br>♠ Subluxation |

**Important Notes**

**√ Remember the X-ray findings in osteoarthritis (LOSS).**

√ Remember that osteoarthritis is triggered and worsen by joint use and relieved by rest "less pain in the morning, more pain at night".

√ On the other hand, RA improves by using the joints as the day goes.

√ Note, associated "**Nodules**" = "**swellings**" due to "**Osteophytes** formation" can be seen on **fingers**. These nodules are called:

(**Heberden**: affecting **Distal IP joints**) and (**Bouchard**: affecting **Proximal IP joints**).

**HD**: **BP**

## ◙ Management of Osteoarthritis (important)

♦ **Exercise** + **Physiotherapy** + **Weigh** loss.

♦ For Pain → **Start with Paracetamol.**

**If the pain is still present and there are no RFs for gastric ulcers**

→ Add NSAIDs "Consider ***Topical*** NSAIDs before trying *Oral* NSAIDs"**.**

(e.g. If he is on NSAIDs and still pain → Add paracetamol and vice versa).

- Whenever you are prescribing NSAIDs (e.g. **Celecoxib**), remember to **add PPI** (e.g. Omeprazole) to prevent gastric ulcers.

♦ Last option → Surgery.

*"**Paracetamol**" is often the valid answer in an **osteoarthritis** scenario.*

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## Osteoarthritis Management in Short

- **First line → Paracetamol and Topical NSAIDs.**
- **Second line (if failed) → Add Oral NSAIDs or COX-2 inhibitor (give PPI as well).**
- **If still in pain → Opioids. E.g., Codeine.**

If codeine is not effective or have side effects eg, constipation:
→ Switch from codeine to tramadol 100 mg twice a day.

Key 15

## Very Important Collection!

***A fall or a hit on outstretched hand can cause:***

√ **Scaphoid bone fracture**.

**(Painful base of thumb ▌tender anatomic snuff-box ▌Ulnar Deviation produces Pain).**

√ **Colle's Fracture** (**Dinner fork deformity**) (**Median Nerve** injury) "especially if there is associated *osteoporosis*"

→ Distal radius is **Dorsally "posteriorly" displaced "fractured", Dorsally angulated**.

√ **Reverse Colle's Fracture = Smith's Fracture** (**Garden Spade Deformity**)

→ Distal radius is **Anteriorly displaced "fractured", Anteriorly angulated**.

**Rx of Colle's fracture in Elderly** "important √" →

**Closed reduction (followed by) Plaster of Paris (POP) Cast Below Elbow**.

√ **Mallet finger** "especially if hit by a ball into his finger → finger bends"

→ Avulsion of **extensor digitorum** tendon at the "**distal**" **IP** joints → flexed - **bent**-finger.

√ **Gamekeeper thumb** (**Skier's thumb**): as it often occurs while skiing.

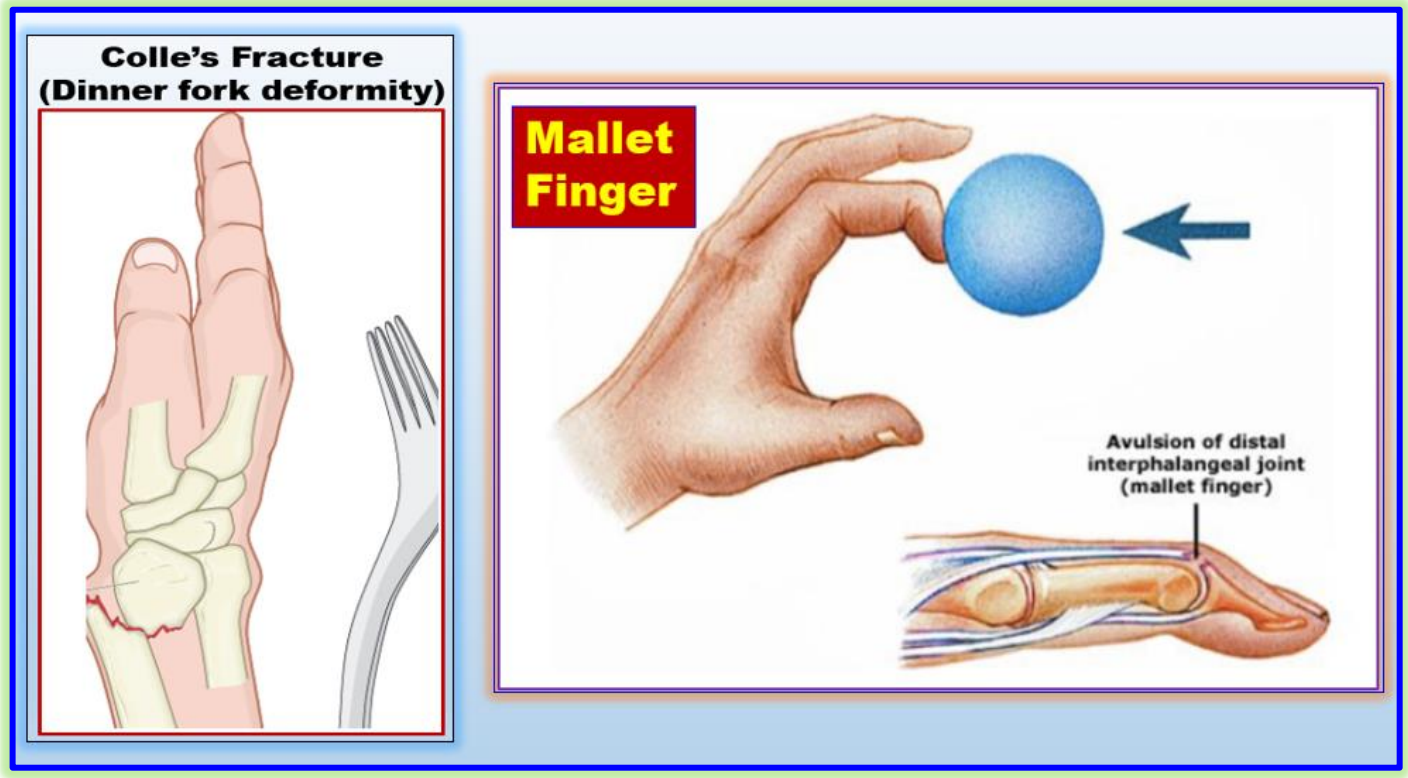
→ injury to **ulnar collateral ligament** → painful swelling/ bruises + **weakness and pain when grasping** things with the thumb + **Tenderness over MCP joints**.

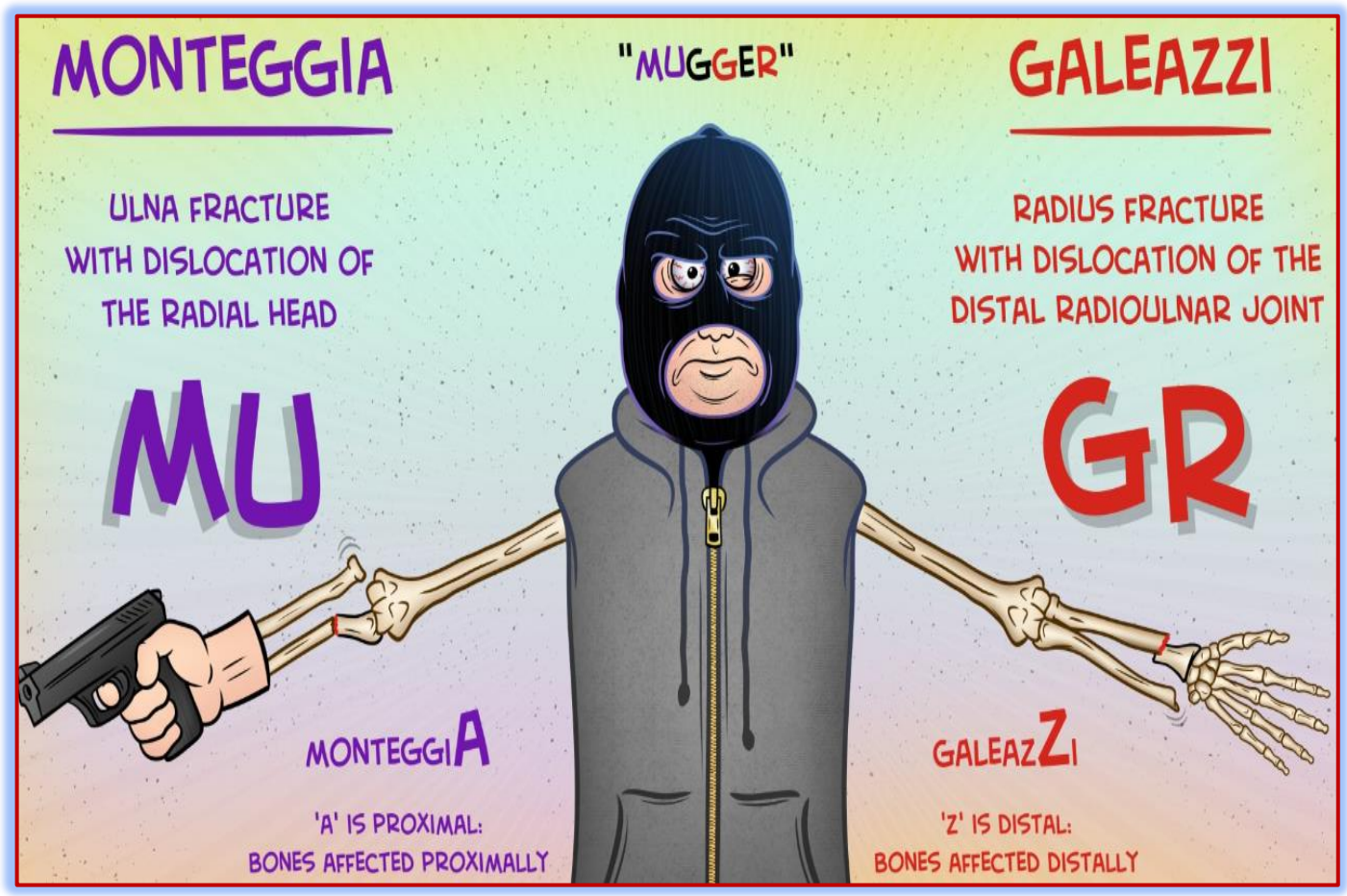
√ **Monteggia Fracture** (Radial Nerve is affected) **(MU: Ulna fractured)**

→ Dislocation of the head of radius + **Fracture** of the **proximal** 1/3 of the **Ulna**.

√ **Galeazzi's Fracture.** **(GR: Radius fractured)**

→ Distal Radio-ulnar joint Dislocation + **Fractured Distal** 1/3 of **Radius** Shaft.






Key 16

**Remember,**

**Repetitive "overhead" "above the shoulder" activities**. Examples:

♠ Volleyball – Tennis – Badminton player, Swimmer.

♠ Carrying heavy objects (e.g. a recent move to a new house).

(+)

**Shoulder weakness, Pain especially on raising arm above shoulder** (e.g. inability to comb hair) and also **pain ↑ at night**

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| | Thick of → **Supraspinatus Tendinitis**. |
| Key 17 | **Paget's disease of the bone**<br><br>◘ ↑ in bone turnover (bone is liable to bend, thicken and becomes spongy).<br><br>◘ Commonly affects axial bone, long bone, and skull.<br><br>◘ The area is warmer due to high vascularity (which may cause ↑ blood flow and thus high cardiac output heart failure).<br><br>**Remember that:**<br><br>• Normal Ca + Normal Phosphate + Normal ALP ➔ **Osteoporosis**.<br>• Normal Ca + Normal Phosphate + High ALP ➔ **Paget's disease**.<br>• Low Ca + Low Phosphate + High ALP ➔ **Osteomalacia**.<br><br>**Bone pain + ↑ Alkaline Phosphatase (ALP) + Multifocal Sclerotic patches on X-Ray ± HF (e.g. shortness of breath on exertion).**<br><br>→ **Paget's disease**. (the other name is "**Osteitis Deformans**").<br><br>○ Note that **Paget's disease** may **rarely** present with **hypercalcemia** in case of immobilisation.<br><br>○ The presence of **hearing loss** + **heart failure** with bone manifestations (e.g. Bone pain, fracture) favours the Dx of **Paget's disease** even if calcium is high. |

## X-ray in Paget's disease

**(Cortical Sclerosis, Coarse trabecular pattern)**

◘ **The blade of grass lesion** (**V-shape pattern** between healthy and diseased long bone).

◘ **Multifocal Sclerotic Patches** (**Cotton wool pattern** in the skull)

**Rx** → **Bisphosphonates**

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♠ **Sclerotic** lesions on X-ray → **Paget's** disease.

♠ **Lytic (Punched-out)** lesions on X-ray → **Multiple** Myeloma.

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Whenever you see **High Alkaline Phosphatase**, think of 2 Bs + P:

1) **B**one: Osteomalacia, Paget's disease, Hyperparathyroidism, Bone metastases.
2) **Bi**liary tract: Cholestasis (Obstructive Jaundice).
3) **P**regnancy (Physiological).

Key 18

***In PLAB 1, if you see a patient presenting with hypercalcemia (↑ Thirst "Polydipsia", Polyuria, bone pain), think of:***

- Bone metastasis "e.g. from prostate (♂) ▌breast (♀)".
- SCC of the lung.
- Multiple Myeloma.
- Primary Hyperparathyroidism. (Phosphate is low, PTH is high or normal).

- **Hypercalcemia picture:**

- Neuro → lethargy, **Confusion**, Depression.
- GIT → Constipation.
- Renal → **polyuria** (increased urination), **Polydipsia** (Thirst).
- CVS → ECG: **Short QT interval**.

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## Multiple Myeloma

√ It is a cancer of **Plasma Cells**.

√ "Overgrowth of plasma cells replacing the bone marrow tissues" + Overproduction of Non-functioning Igs (Immunoglobulins).

**√ The main presenting Symptoms:**

- **Bone pain** "Particularly in the **back** and **ribs**".
- **Hypercalcemia** → **Polyuria**, **Polydipsia**, Low mood, **Confusion**.
- **Anemia** → **Fatigue**, **Weakness**, Pallor, Dyspnea on exertion.

**√ Others:**

- **Recurrent Infections** → As the immunoglobulins are functionless.
- **Renal Failure**.

**√ Important Notes on Investigations:**

♦ **Bone Marrow Biopsy** → **Abundant Plasma cells** (**Diagnostic √**).

♦ **Serum Protein Electrophoresis** → **↑↑↑ Monoclonal Immunoglobulin Spike**.

♦ **Urine Protein Electrophoresis** → **Bence Jone's Protein**. √

♦ **Blood Film** → **Rouleaux Formation**.

♦ **X-Ray Skeleton** → **Lytic Lesions** "plasma cells → Osteoclasts → Bone Lysis".

♦ **↑ $Ca^{++}$** (>2.6 mmol/L) but with **Normal Alkaline Phosphatase** (30-150 U/L).

♦ **Anemia** (Normocytic Normochromic).

♦ **Renal functions could be impaired** (Low GFR, High Urea and Creatinine).

♦ **High ESR**

Important: **Don't mix up things**. Plasma cells are cells seen on BM biopsy whereas Bence Jone's is Protein seen on urine protein electrophoresis!

## *Example* (1),

60 YO ♂ presents with Hx of Back and Ribs pain + being Thirsty + Tiredness.

Hb is 90 g/L (low) ▌ $Ca^{++}$ is 4 (high) ▌ ALP is 115 (normal) ▌ ESR is 88 ▌ eGFR is 45 (low).

◙ The likely Dx → **Multiple Myeloma**.

◙ The cell type to be found in BM → **Plasma Cells**.

◙ The Diagnostic Test → **Bone Marrow Biopsy**.

◙ The likely finding on blood film → **Rouleaux Formation**.

√ Anemia is the commonest laboratory finding in MM.

√ Renal Impairment presents in 50% of MM cases.

√ In MM, High Calcium but normal ALP.

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## *Example* (2),

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| | 92 YO ♀ complains of severe back pain. She claims that she had a fight and someone has broken her back and insists that her mother is coming to visit her at the hospital.<br>Hb 109 (low) ▌Urea 7.5 (high) ▌Creatinine 285 (high) ▌Calcium 3 (high)<br><br>◙ The likely Dx → **Multiple Myeloma**.<br>◙ The cell type to be found in **BM** → **Plasma Cells**.<br>◙ The protein to be found on **Urine Electrophoresis** → **Bence-Jones Protein**.<br>√ The features present in this stem supporting the Dx of Multiple Myeloma:<br>Back pain ▌Confusion "her mother is visiting her" ▌<br>Anemia ▌Hypercalcemia ▌Impaired Renal Function. |
| Key 19 | Following a femur fracture, the absence of proximal and distal pulses in a lower limb indicates an injury to → **Femoral artery**.<br>"*the patient may be **hypotensive***"<br><br>**Notes**:<br>√ **Posterior tibial artery**<br>→ Posterior compartment of the leg + Planter surface of the foot.<br><br>√ **Dorsalis Pedis**<br>→ Foot. |

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| Key 20 | In any fracture (e.g. leg), if there is one of the following:<br>◘ **Absence of Pulses** "**Neurovascular compromise**".<br>◘ **Obvious Deformity**.<br><br>The **immediate** "**Next**" action after ABCD to be done is<br>→ **Urgent Reduction under Sedation or Analgesia**<br><br>After that, A referral to neurovascular/ orthopaedics should be made.<br><br>"We aim at restoring the blood supply "the pulses" by an immediate reduction "usually under IV Midazolam" even before X-ray.<br>The time is key in such cases.<br><br>---<br><br>◙ **Remember form "Emergency Chapter":**<br><br>In a **femur fracture**, if the patient is hemodynamically stable (SBP >100)<br>→ **Thomas Splint** first "Before IV fluid and before ABCDE"<br>This is to align the fracture; thus, reducing the blood loss as the femur fracture bleeds significantly). |

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| | You need to know that splinting the femur → Alignment of the fracture → Reduce the blood loss. |
| Key 21 | **A child presenting with Painful Hip (+)**<br><br>◙ Mild fever ▌WBCs and ESR are normal or mildly elevated ▌No local signs (no redness, tenderness, swelling) Happy and systemically well child<br>→ **Transient Synovitis**.<br><br>◙ Fever > 38.5 ▌WBCs > 12000, ESR > 40 ▌There are tenderness, redness, swelling of hip/leg ▌Systemically unwell<br>→ **Septic Arthritis**.<br><br>◙ A child "Boy" with limping ▌shortened leg ▌externally rotated leg<br>→ **Slipped upper femoral epiphysis**.<br><br>◙ A child "girl" ▌Breech presentation ▌FHx ▌Limping ▌Painless leg that is shorter than the other ▌Unequal skin fold<br>→ **Developmental Dysplasia of the Hip (DDH).** |

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| Key 22 | An elderly man fell at home 2 days ago and presents with hip pain and inability to bear weight on his right leg. X-ray shows a fracture of **acetabulum**.<br><br>The most likely affected nerve → **Sciatic nerve**. |

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**The following Keys are Critical for PLAB 1 exam and for General Knowledge:**

- Wrist Drop → **Radial Nerve**.
- Foot Drop → Either **Common Peroneal** (More common) Nerve or **Sciatic n**.
- Claw Hand → **Ulnar Nerve**.
- Paraesthesia of thumb, index, MIDDLE finger → **Median Neve**.
- Paraesthesia of little finger + ring finger → **Ulnar nerve**
- Paraesthesia of the dorsal aspect of the THUMB +/- a small area over the ((dorsal)) area between 1st (Thumb) and 2nd (Index) fingers → **Radial Nerve**.
- Numbness on Superior aspect of upper arm just below shoulder joint → **Axillary Nerve**.
- Fibular Neck Fracture → **Common Peroneal Nerve**.
- Femur Neck Fracture → **Sciatic Nerve**.
- **Acetabular Fracture** → **Sciatic Nerve**.
- Posterior dislocation of the hip → **Sciatic Nerve**.
- Humeral Shaft Fracture → **Radial Nerve**.

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| | - Humeral Neck Fracture → **Axillary Nerve**.<br>- Monteggia Fracture → **Radial Nerve**.<br>- Colle's fracture "dinner fork deformity" → **Median Nerve** (Hand numbness).<br>- Paraesthesia and impaired sensation in both hands (Glove distribution) → **Peripheral Neuropathy**. |
| Key 23 | **A Scenario to Study**<br><br>*A 47 YO ♀ with a Hx of breast cancer presents with painful, dull-aching pain over her right shoulder and thoracic spine. The pain is worse on lying down. She goes to gym frequently as well. X-ray shows some degenerative changes.*<br><br>◙ **This is NOT a case of osteoarthritis. Why?**<br><br>**√** The X-ray findings specific for osteoarthritis are not present here which are **LOSS**: **L**oss of joint space, **O**steophytes, **S**ubchondral cysts, **S**ubchondral sclerosis)<br><br>**√** The pain in osteoarthritis is worse on use "activity". Here, it is worse on lying.<br><br>◙ **This is likely a case of breast metastasis to bone.** |

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| | ◙ **About the investigations, (Important √)**<br>♦ The most **INITIAL** test → **Serum Calcium**<br>♦ The most **APPROPRIATE** test → **MRI**, if not in the options<br>→ **Bone scintigraphy**.<br><br>***√ The gold standard for bone metastasis is (MRI), followed by (Bone Scintigraphy).***<br><br>Be careful for the question's words!<br><br>---<br><br>**Note**,<br>**DEXA Scan** → measures bone density → in **Osteoporosis**.<br>**Skeletal Survey** → in **Multiple Myeloma** "lytic – punched out lesions on X-ray). |
| Key 24 | ◙ Bear in mind that a prolonged use of **Steroids** can cause<br>→ **Osteoporosis**.<br><br>◙ Osteoporosis affects bone but the effect is silent (no pain or aches) until a fracture occurs.<br><br>◙ **Osteoporosis** can also affect oral and dental health → **Loss of teeth**. |

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| | ◙ **The side effects of Long-term use of steroids are numerous, examples**:<br>**Osteoporosis** ▌**Cataract** ▌**Peptic Ulcers** ▌**Hyperglycemia**<br><br>√ Remember, osteoporosis is painless, osteomalacia is painful.<br><br>---<br><br>**Scenario**,<br><br>An old female with a Hx of multiple fractures a few years ago. She is also on long-term corticosteroids for Inflammatory bowel disease.<br><br>The best modality → **DEXA Scan** (Dual-Energy X-ray Absorptiometry).<br><br>She is a "**female**" on prolonged **Steroid** → Osteoporosis → Multiple fracture.<br><br>**DEXA Scan** → measures **bone density** → in **Osteoporosis**. |
| Key 25 | ◙ A young boy + Painful knee + Gait abnormality + Tender, smooth, fixed mass over a knee side.<br>→ **Osteosarcoma** "the **commonest** bone tumor in children". |

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| | ◙ A young boy + Painful knee + Gait abnormality + Tender, smooth, fixed mass over a knee side + Other systemic (Fever, Weight loss, Tiredness)<br>→ **Ewing Sarcoma** "the **2nd commonest** bone tumor in children". |
| Key 26 | Fracture of the **Head** of the radius<br>Fracture of the **Neck** of the radius<br><br>Both have similar features:<br>√ **Lateral elbow swelling**.<br>√ **Limited range of elbow movement**.<br>√ **Passive rotation of elbow → ↑ Pain**<br><br>◙ **However**,<br>Radius **HeaD** Fracture → More common in **Adults** (HeADult)<br>Radius **Neck** Fracture → More common in **childreN**.<br><br>◙ **Therefore, look at the age in the scenario,**<br>*If young age (up 16) → Radius Neck fracture.*<br>*If Older age → Radius Head fracture.* |

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| Key 27 | **Femur** fracture → the patient's level of consciousness and O2 saturation deteriorate after surgery (24-72 hours)<br><br>→ Suspect **Fat Embolism** "**common in long bone fractures especially femur**".<br><br>Polytrauma -Multiple fractures- esp. of the long bones, particularly femur and pelvis followed by open reduction surgery, followed by deterioration: (hypoxemia + neurologic e.g.↓ consciousness-)<br><br>→ **Fat Embolism** is likely the cause. |
| Key 28 | **Remember**,<br><br>◙ **Fracture of distal radius + Dorsal Angulation (Dorsally displaced fragments)**<br><br>→ **Colle's fracture** (**Dinner Fork Deformity**)<br><br>◙ **The likely injured nerve → Median Nerve. (Numbness of hand).**<br><br>♠ **Rx in elderly**<br><br>→ **Closed reduction followed by POP "Plaster of Paris" cast below elbow**. |

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| | **♠ Rx in Young**<br>→ **Above elbow Backslab cast**.<br><br>**♠ If there are intra-articular fractures/ incongruity**<br>→ Open reduction and internal fixation. |
| Key 29 | **The commonest Origins of Bone Metastasis**<br>(commonly **Spine**, then pelvis, then ribs, then skull and long bones)<br><br>In Males ♂ → **PROSTATE** then Lung.<br><br>In Females ♀ → **BREAST** then Lung. |
| Key 30 | Whenever **high Alkaline phosphatase** with **Normal Calcium**<br>→ Think **Paget's disease**.<br><br>*Other features → Knee pain, Back pain, Kyphosis, Hearing loss, Heart Failure.*<br><br>---<br><br>• Normal Ca + Normal Phosphate + Normal ALP ➔ **Osteoporosis**. |

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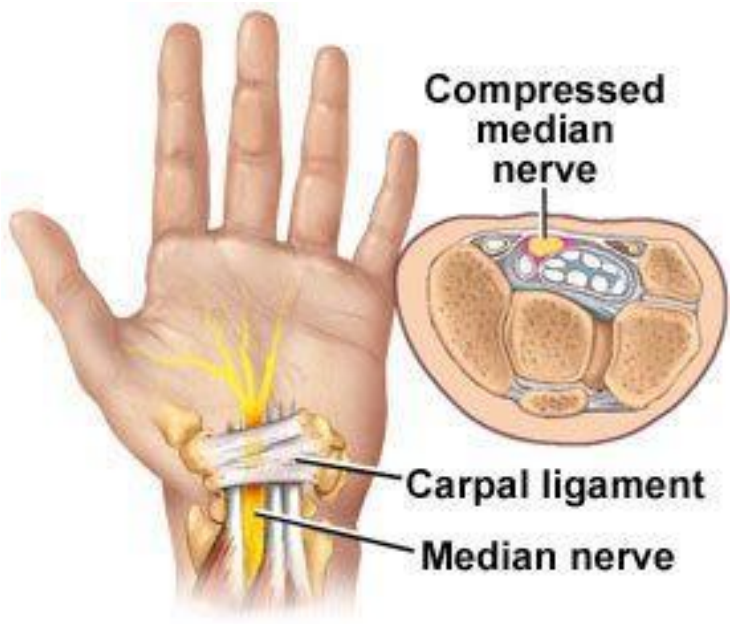
| | • Normal Ca + Normal Phosphate + High ALP ➔ **Paget's disease**.<br>• Low Ca + Low Phosphate + High ALP ➔ **Osteomalacia**. |
| Key 31 | ◙ **Numbness** and **Tingling** of the **thumb**, **index** and **middle** fingers<br>→ Think of **Carpal Tunnel Syndrome**<br><br>◙ The **Transverse Carpal Ligament** compresses the **MEDIAN nerve**.<br><br>◙ Thus, the treatment would be → **Cut the Transverse Carpal Ligament = Release Flexor Retinaculum**<br>to release the pressure on the median nerve.<br><br>♠ **Note**: **Transverse Carpal Ligament** is also called = **Flexor Retinaculum** = **Anterior Annular Ligament**.<br>  <br> |

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| | ◙ **Notes**:<br>√ **Pregnancy** is an important **RF** for Carpal Tunnel Syndrome (due to fluid retention).<br>√ **Tinel Test** is **not always positive** in Carpal Tunnel Syndrome "very low sensitivity".<br>√ After applying cast for scaphoid bone fracture, tension may develop resulting in Carpal Tunnel Syndrome. Release the flexor retinaculum to alleviate the tingling, pain of thumb, index and middle fingers due to the compressed median nerve might be indicated.<br><br>√ If pregnant with Carpal Tunnel Syndrome<br>→ wear **Wrist Splints until delivery** (usually resolves after delivery).<br>√ If it did not resolve and long-standing → **cut the transverse carpal ligament**. |
| Key 32 | **Sprain injury**<br><br>◙ A sprain, also known as a torn ligament, is damage to one or more ligaments in a joint, often caused by trauma or the joint being taken beyond its functional range of motion (overstretched).<br><br>◙ Sprains can occur in any joint but are most common in the **ankle** and **wrist**.<br><br>◙ **Signs and symptoms:** |

**Severe Pain**

**Rapid Swelling**

**Bruising**

**Decreased ability to move the limb**

**Difficulty using the affected extremity**

◙ **Management → P.R.I.C.E**

**P**rotect

**R**est

**I**ce

**C**ompress

**E**levate (eg, **high arm sling for a few days**).

♠ **Example**,

A factory worker has his hand stuck in a machine. He presents with extremely painful wrist, rapidly increasing swelling, limited range of hand movement.

X-ray shows no fractures.

♦ The likely Ds → **Sprains injury**.

♦ Management → **PRICE** → **High arm sling for 3 days** (elevation). √

Key 33

# Septic Arthritis

**Monoarthritis** = Single joint involvement (commonly **Knee**)

**Fever**/ **Pain**/ **Swelling**/ **Limited movement**

+ A **Risk factor** (e.g. **DM**, **Steroid**, **HIV**, **Rheumatoid Arthritis**) "important √"

Think of → **Septic Arthritis**

♦ The commonest causative organism → **Staphylococcus Aureus**.

♦ A common organism in young SEXUALLY active → N. Gonorrhea.

## ♦ Dx

√ ***Aspiration of Synovial Fluid*** → send for staining, microscopy, WBC count and Culture.

√ ***Blood Culture***.

## ♦ Management

√ **Flucloxacillin** (for 4-6 weeks) "first-line" "like cellulitis"

√ If penicillin allergic → **Clindamycin**.

√ If the causative organism is N. Gonorrhea nor Staph → **Cefotaxime** or **Ceftriaxone**.

√ If still not responding → **Repeated percutaneous aspiration**.

"*IV antibiotics for 1 week until blood cultures become -ve and swelling resolves*

*Then, Oral antibiotics for 4 weeks*"

◙ **Note, do not forget (DM, RA) as risk factors for Septic Arthritis.**

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**Septic arthritis is different from Reactive arthritis.**

**Reactive arthritis**: Seronegative Spondyloarthritis

(**Migratory Oligoarthritis of lower limbs** + **Back pain** + **Extraarticular features**)

- Typically, there is **no fever**.
- Typically, seen in **young adults**.
- Typically follows **Urogenital infection "STI"** or **GI infection "dysenteric illness"**.
- **Asymmetric**, **Migratory Oligoarthritis** of **LL** (Knees and Ankles).

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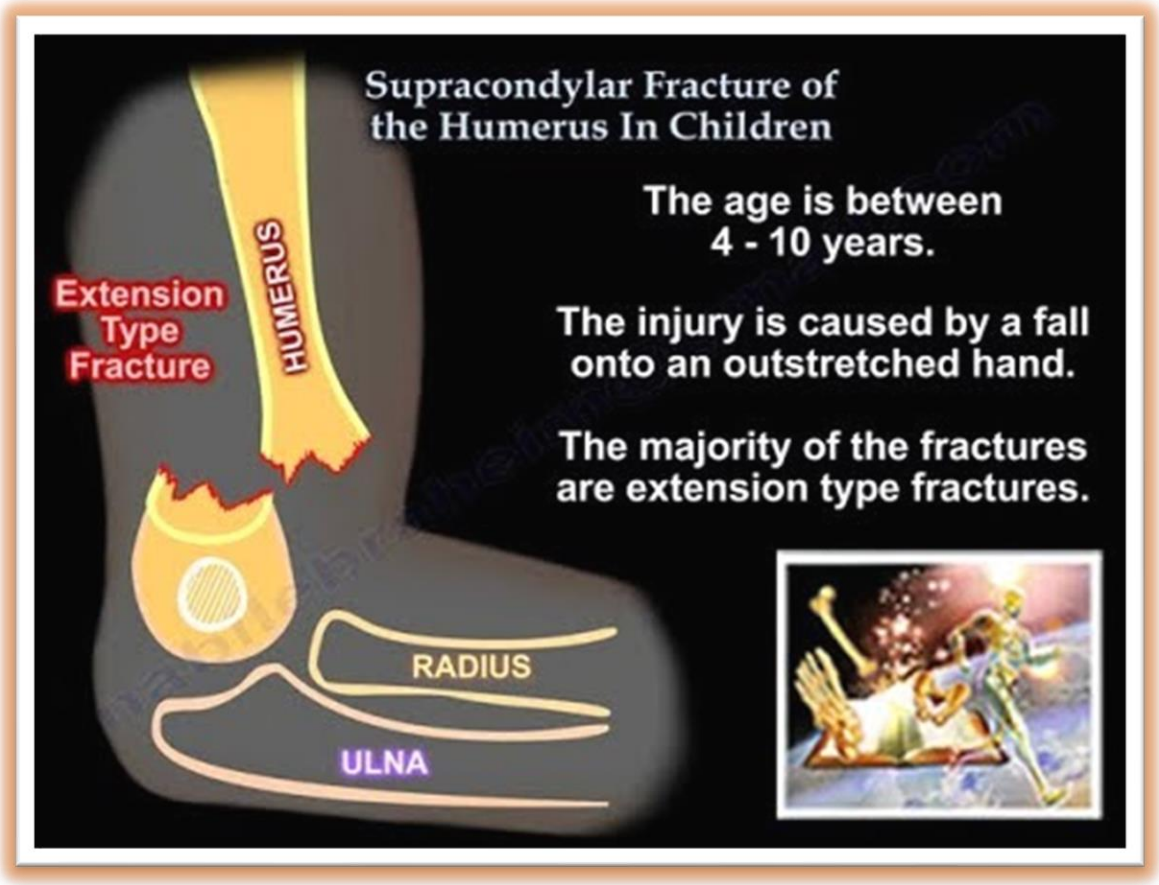
| | • **Extraarticular features: (Reiter's Triad)**<br>√ ***Cannot see*** → *Conjunctivitis*, Uveitis.<br>√ ***Cannot pee*** → *Urethritis*.<br>√ ***Cannot climb a tree*** → *Arthritis*.<br>+ ***Skin manifestations***<br>*circinate balanitis* (painless vesicles on the coronal margin of the prepuce), *keratoderma blenorrhagica* (waxy yellow/brown papules on palms and soles)<br>*Erythema nodosum* (Tender, red nodules over shins).<br><br>**Management**<br>♦ Symptomatic: analgesia, NSAIDS, intra-articular steroids<br>♦ Sulfasalazine and methotrexate are sometimes used for persistent disease<br>♦ Symptoms rarely last more than 12 months |
| Key 34 | A **child** (4-10 YO) fell on his **outstretched** "**arm**"<br>+<br>**Absent radial/ brachial pulse**<br><br>Think → **Angulated Supracondylar Fracture of Humerus**.<br><br>The most likely structure to be damaged → **Brachial artery**. √ imp. |

*"Supracondylar fracture "extension type" is the commonest fracture in children who fall on extended -outstretched- arm"*

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If Supracondylar fracture of humerus is not in the options, and the falling victim on an outstretched "arm" is a **child**, look for → **Greenstick fracture**.

As the bones in young children are still **soft**, they tend not to break completely, forming what's called "Greenstick Fracture".

It is tender, but no visible deformity.

**Greenstick Fracture in a child (It usually appears on X-Ray)**

In toddlers (1-3 YO), consider **spiral** fracture, it might **not** be seen on X-ray.

Key 35

Important, do not get tricked

√ **Colle's Fracture** (**Dinner fork deformity**) (**Median Nerve** injury)

"especially if there is associated *osteoporosis*"

→ Distal radius is **Dorsally displaced "fractured", Dorsally angulated**.

√ **Reverse Colle's Fracture = Smith's Fracture**

(**Garden Spade Deformity**)

→ Distal radius is **Anteriorly displaced "fractured", Anteriorly angulated**.

## IMPORTANT

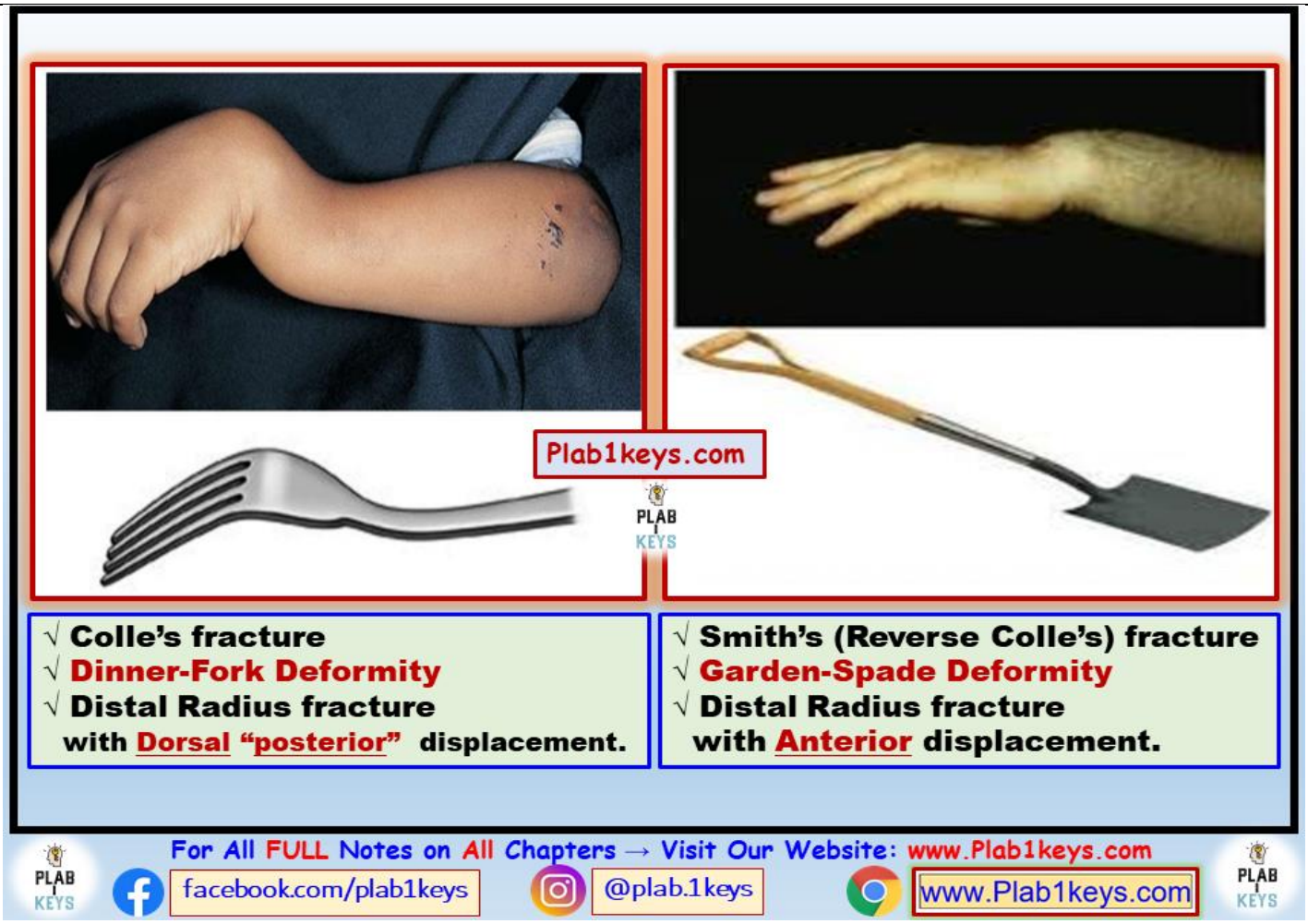
◙ Fracture of distal radius with **DORSAL** "posterior" displacement

→ **Colle's fracture** → **Dinner Fork Deformity**.

◙ Fracture of distal radius with **ANTERIOR** displacement

→ **Reverse Colle's Fracture = Smith's fracture**

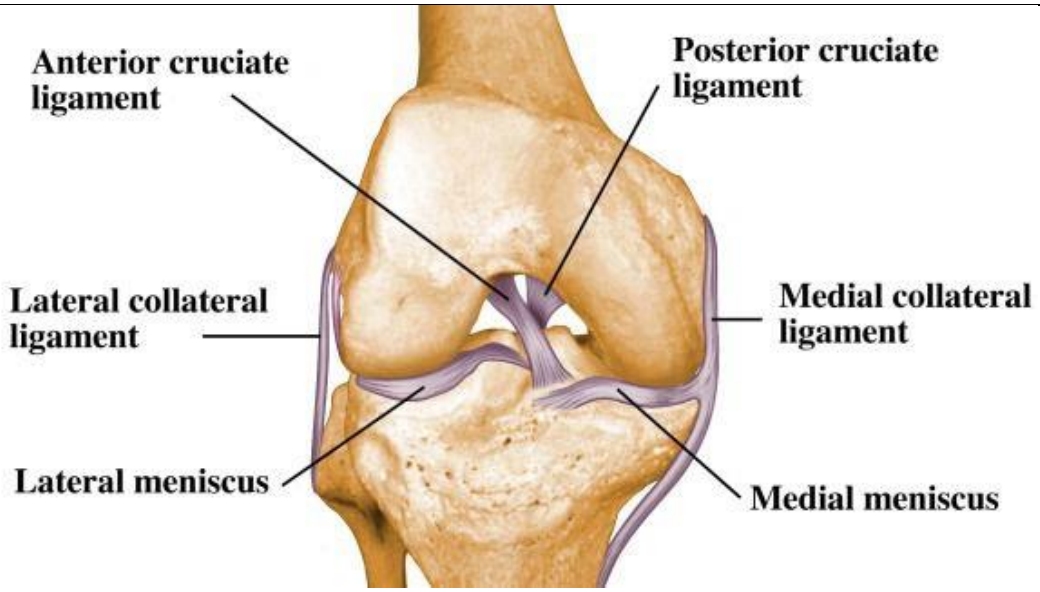
→ **Garden Spade Deformity**.




Key 36

## Clinchers for Knee Injuries.

Before the clinchers, look at this picture and locate the anterior cruciate ligament, **menisci**, **cruciate ligaments,** and **Collateral ligaments.**




***Example, a player jumps and lands on a slightly twisted knee, presents with:***

♦ **Locking** (Locked leg) → **Meniscal tear**.

♦ **+ve Apley and McMurray tests** → **Meniscal tear**.

**Imp √**, meniscal tears are best seen by → **MRI scan**

♦ **Popping** → **Anterior Cruciate Ligament injury**.

♠ ***Note**, Meniscal tears are often associated with Anterior Cruciate Ligament injury.*

♦ ***Immediate*** **swelling →** **Anterior Cruciate Ligament injury**

♦ ***Delayed*** **swelling →** **Meniscal tears**

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♦ Hyperflexion or **Anterior** direct impact (Dashboard)

→ **POSTERIOR** Cruciate Ligament injury.

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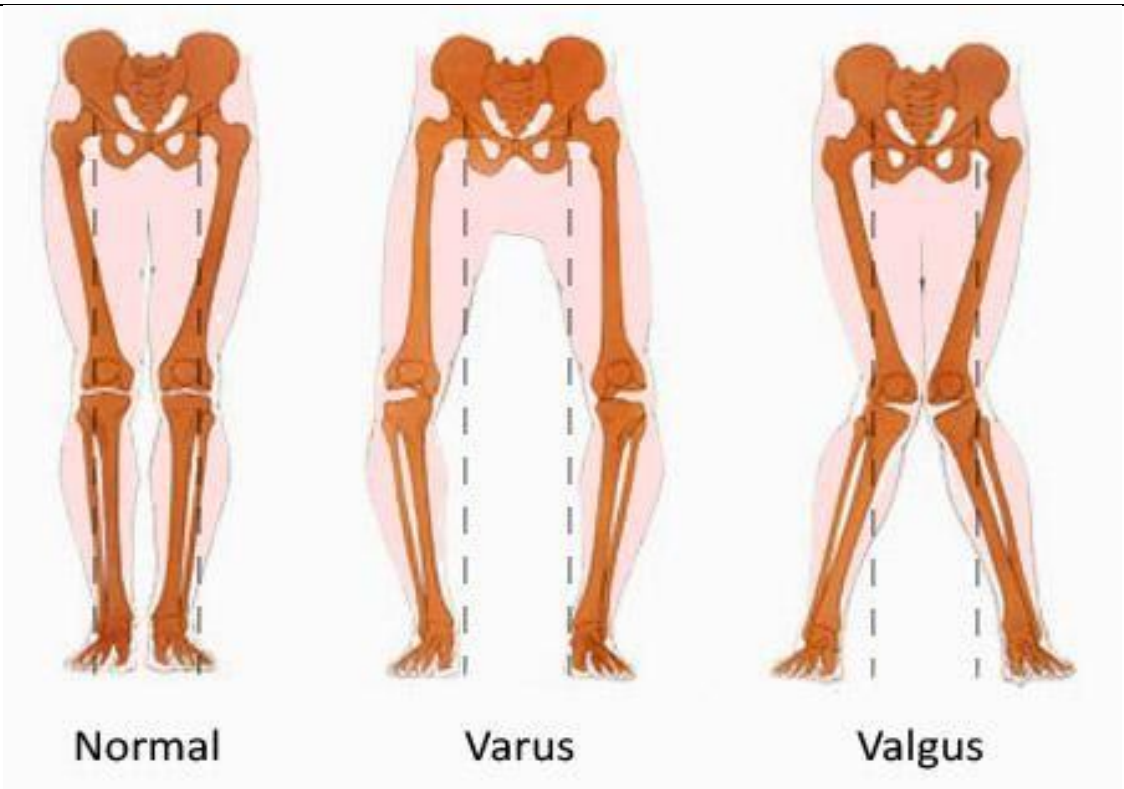
♣ Direct impact to the **lateral** side (**Valgus** stress test is **+ve. Ie, there is pain on valgus stress test**):

→ **Medial** Collateral Ligament injury. *Important √*

♣ Direct impact to the **medial** side (**Varus** stress test is **+ve. Ie, there is pain on valgus stress test**)

→ **Lateral** Collateral Ligament injury. *Important √*

*(The opposite Rule)*




**Valgus** = **impact to lateral** collateral ligament → **injury to Medial** collateral.

e.g. a player fell on his knee and presents with valgus stress test being +ve → **Medial collateral ligament injury**.

**Varus** = **impact to Medial** collateral ligament → **injury to Lateral** collateral.

e.g. a player fell on his knee and presents with Varus stress test being +ve → **Lateral collateral ligament injury**.

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| | **Other Important Notes:**<br><br>**√ Anterior drawer test (Lachman test)** → Anterior Cruciate Ligament.<br><br>**√ Posterior drawer test** → Posterior Cruciate Ligament.<br><br>**√ +ve Apley** and **McMurray tests, locking sensations**<br><br>→ Meniscal tear → do MRI Knee. √ |
| Key 37 | Fracture of middle to distal third of humerus (**shaft of humerus**)<br>→ **Radial nerve injury**<br>→ **Wrist Drop** (**unable to dorsiflex wrist**). |
| Key 38 | **√** After applying cast for scaphoid bone fracture, tension may develop resulting in **Carpal Tunnel Syndrome**. Management?<br><br>→ **Release of flexor retinaculum** to alleviate the tingling, pain and the limited movements of thumb, index and middle fingers due to the compressed **median nerve.**<br><br>♦ **Remember**,<br>Flexor retinaculum = Transverse carpal ligament = Anterior annular ligament |
| Key 39 | ◙ A young boy + Painful knee + Gait abnormality + Tender, smooth, fixed mass over a knee side. |

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| | → **Osteosarcoma** "the **commonest** bone tumor in children".<br><br>◙ A young boy + Painful knee + Gait abnormality + Tender, smooth, fixed mass over a knee side + **Other systemic** (**Fever, Weight loss, Tiredness**)<br>→ **Ewing Sarcoma** "the **2nd commonest** bone tumor in children".<br><br>So, if no fever → Osteosarcoma ▌If with fever → Ewing Sarcoma.<br><br>**Another differentiation point is X-ray**<br><br>√ X-ray → **Sunburst** lytic bone lesions → **Osteosarcoma**<br>√ X-ray → Lytic lesion + **Onion-Skin** layers → **Ewing Sarcoma**. |
| Key 40 | **Remember**,<br><br>**√ Severe lower back pain that radiates to a leg (could be Acute sudden onset)**<br>√ Lying supine with legs raised → ↑ pain. (+ve straight leg raising test)<br>**√ Lying down → relieves (↓) pain** |

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| | ♦ **The likely Dx →** Lumbosacral disc herniation**.**<br>♦ **Next step →** Reassure and prescribe analgesics**.**<br>♦ **If any red-flags or this option is not given →** MRI Spine**.** |
| Key 41 | **Remember**,<br>The best modality for bone metastasis → **MRI**, followed by **Bone Scintigraphy**.<br><br>MRI should be done within 7 days if there is bone pain only.<br>MRI should be done within 24 hours if pain + Neurological signs. |
| Key 42 | - **Proximal Biceps Tendon Rupture**: Muscle bunches up in the distal arm, **Popeye** appearance.<br><br>- **Distal Biceps Tendon Rupture**: Single traumatic event (e.g. flexion against resistance), sudden sharp tearing sensation, painful swollen elbow, weakness of flexion and supination.<br><br>***"The patient feels that something in the cubital fossa has ruptured"*** |

## Notes:

- **De Quervain's disease**: (= **washer woman** = **mammy thumb**): Pain under root of **thumb** (**tenosynovitis**). Common in **postpartum** women.

- **Tennis elbow** = **lateral epicondylitis** → affected wrist extension. Mainly due to overuse e.g. in tennis players.

  → Paracetamol for pain + Physiotherapy (1st line)

- **Golfer's Elbow** = **Medial epicondylitis**: all flexors to fingers and pronator are affected. Seen in baseball players, construction injury, plumber injury.

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## Important,

♠ **Lateral epicondylitis** (**Tennis Elbow**) → Lateral epicondyle tenderness → Affected **Wrist extensors**. (pain ↑ on resisted **extension** of wrist).

Rx → Paracetamol for pain + **Physiotherapy** (1st line)

♠ **Medial epicondylitis** (**GolFer's Elbow**) → Medial epicondyle tenderness → Affected **Wrist Flexors**. (pain ↑ on resisted **flexion** of wrist).

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| | Tennis = Extensors of wrist = **Lateral** epicondylitis.<br>GolFer = **F**lexors of wrist = **Medial** epicondylitis. |
| Key 43 | **Colle's fracture** occurs commonly in patients with **Osteoporosis**.<br>Thus, to assess risk for future fracture, we need to measure the bone density by → **DEXA Scan**. |
| Key 44 | **Remember and do NOT mix things up:**<br>- Humeral **Shaft** Fracture → **Radial Nerve**.<br>- Humeral **Neck** Fracture → **Axillary Nerve**. (NERVE not artery!!) |
| Key 45 | **Remember**,<br>◘ Monoarthritis (Hip, Knee mainly)<br>◘ Pain following use (tired joints at the end of the day)<br>◘ Improves with rest<br>◘ Unilateral symptoms<br>◘ No systemic upset<br>± Crepitus<br>→ **Osteoarthritis** |

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| | **Management**:<br><br>♦ **Exercise** + **Physiotherapy** + **Weigh** loss<br>♦ **Start with Paracetamol.**<br>**If pain is still present and there are no RFs for gastric ulcers**<br>→ Add NSAIDs "Consider *Topical* NSAIDs before trying *Oral* NSAIDs"**.**<br>(e.g. If he is on NSAIDs and still pain → Add paracetamol and vice versa).<br>- Whenever you are prescribing NSAIDs (e.g. **Celecoxib**), remember to **add PPI** (e.g. Omeprazole) to prevent gastric ulcers.<br>♦ Last option → Surgery.<br><br>*"**Paracetamol**" is often the valid answer in an **osteoarthritis** scenario.* |
| Key 46 | **Osteoarthritis patient is on paracetamol and topical NSAIDs but still in pain**<br><br>→ **Add oral NSAIDs (**Remember to give PPI if peptic ulcer risk**).**<br><br>◙ **If still in pain → Opioids.**<br><br>**Osteoarthritis Management in short** |

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| | • **First line → Paracetamol and Topical NSAIDs.**<br><br>• **Second line (if failed) → Add oral NSAIDs or COX-2 inhibitor (give PPI as well).**<br><br>• **If still in pain → Opioids.** |
| Key 47 | **T-Score by DEXA scan of – 2.5 or lower (e.g. -2.9)**<br><br>**→ Osteoporosis**<br><br>**→ give Bisphosphonate** (eg, **alendronate**, **risedronate**, **zoledronate**).<br><br>**Important note:**<br>• In general, **bisphosphonate** is used for **osteoporosis**.<br>• However, women who are undergoing surgical menopause (ie, **oophorectomy**) need to take hormone replacement therapy -HRT- eg, Oestradiol with or without Progesterone until the age of 51 year which is the average age of natural menopause.<br>• One of **HRT** benefits in this case is the **prevention of osteoporosis**. |

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| Key 48 | ◙ **A child presents with Fever ▌High WBCs and ESR ▌There is tenderness, redness, swelling of hip/leg:**<br><br>→ **Septic Arthritis**.<br>→ Flucloxacillin (1st line).<br>If penicillin-allergic → clindamycin.<br>If MRSA → Vancomycin. |
| Key 49 | **A 50-year-old woman with osteoporosis.**<br><br>To assess for **Future Fractures** → **DEXA Scan** |
| Key 50 | ◙ A swelling behind the knee (in the popliteal fossa), usually asymptomatic, round, smooth, non-tender → **Baker cyst (popliteal cyst)** |
| Key 51 | ◙ **A toddler (1-3 YO) presents with severe pain and tenderness of shin. He cannot walk or stand. This happened after a fall. No deformity, No Bruises. X-ray looks normal.**<br><br>The likely Dx → **Spiral fracture** (toddler's fracture, often not seen on X-ray) |
| Key 52 | ◙ In any patient on **Warfarin**, the most important symptom that he needs to urgently report is |

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| | → **HEADACHE**<br><br>*(This is because people on warfarin are liable to subdural hematoma which presents with headache, confusion and other features)*<br><br>◙ In any patient on **Bisphosphonates**, the most important symptom that needs to be urgently reported is<br>→ **Severe, sudden Heartburn** ▌or **Chest pain** (either is correct) |
| Key 53 | **Very Important notes,**<br><br>♦ After prescribing **oral bisphosphonate** (e.g. Alendronic Acid)<br><br>**→ Inform the patient that dyspepsia and reflux are common in the first month of treatment and often improve with continuous use.**<br><br>**Also, inform the patient to seek advice if he develops a new symptom of heartburn. √ imp.**<br><br>♦ To reduce severity of these symptoms → Take the oral bisphosphonate while in an **upright position** and maintain an upright position for a minimum of 30 minutes after taking the medication.<br><br>♦ **Swallow** the pills with a glass of plain water, do not suck or chew them (risk of oropharyngeal ulcers). |

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| | ♦ In osteoporosis patients who are **already on alendronate** → **DEXA** scan (for bone mineral density) should be checked **every 3 to 5 years**.<br>♦ In osteoporosis patients who have **stopped taking alendronate** → **DEXA** scan (for bone mineral density) should be checked **after 2 years**.<br>♦ 2 forms of oral alendronic acid:<br>→ 70 mg **once weekly OR** 10 mg **once daily**. There is **no monthly regimen**.<br><br>• **T-Score**: assessed **by DEXA** and reflects Bone Mineral Density (BMD):<br>1) -1 or higher → **Normal**<br>2) Between -1 and -2.5 → **Osteopenia**<br>3) -2.5 or lower → **Osteoporosis** (e.g. -2.7 → osteoporosis)<br>→ Give bisphosphonate (e.g. alendronate). |
| Key 54 | **A 54-year-old woman complains of low back pain for which she needed long-term steroid use. She is now complaining of her teeth being loose. Other examinations appear normal.**<br>**What investigation will best lead to a diagnosis?**<br><br>A. CT of the low back<br>B. **DEXA scan**<br>C. MRI of the spine |

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| | D. Radio nuclear scan<br>E. Skeletal survey<br><br>**Long-term use of steroids can lead to osteoporosis which can present with loose teeth. For Osteoporosis, we use DEXA Scan.**<br><br>**Note**,<br>**DEXA Scan** → measures bone density → in **Osteoporosis**.<br>**Skeletal Survey** → in **Multiple Myeloma** "lytic – punched out lesions on X-ray).<br>**The gold standard for bone metastasis is (MRI), followed by (Bone Scintigraphy).** |
| Key 55 | **A 65yrs old woman who fractured her wrist had hysterectomy done. FBS and LFT are normal. What to do to prevent further fractures?**<br><br>**Alendronate (= alendronic acid) = Bisphosphonates**<br>Calcitriol<br>Estrogen<br>Tibolone<br>HRT<br><br>**Osteoporosis.** |

√ To assess for **Future Fractures** → **DEXA**

√ To prevent further fractures → **Bisphosphonates**.

• HRT (Hormonal Replacement Therapy) should **not** be given as a first line management as it has serious side effects such as Venous Thromboembolism (VTE), Stroke, Breast cancer, coronary diseases.

• Bisphosphonate examples → **alendronate**, **risedronate**, **zoledronate**

## Important note:

• If she was younger (<51 YO), no history of fractures, and had oophorectomy → give **HRT** (estradiol +/- progesterone) to prevent osteoporosis.

• In general, **bisphosphonate** is used for **osteoporosis**.

• However, women who are **<51 YO**, and are undergoing surgical menopause (ie, **oophorectomy +/- hysterectomy**) need to take hormone replacement therapy -**HRT**- eg, Oestradiol with or without Progesterone until the age of 51 year which is the average age of natural menopause.

• One of **HRT** benefits in this case is the **prevention of osteoporosis**.

• Progesterone is not given if there is no uterus (if hysterectomy is also done) as the main aim of progesterone is to prevent endometrial proliferation and thus reduce risk of endometrial cancer. If no uterus → give oestradiol only.

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| | • However, women who are undergoing surgical menopause (ie, **oophorectomy**) need to take hormone replacement therapy -HRT- eg, Oestradiol with or without Progesterone until the age of 51 year which is the average age of natural menopause.<br>• One of **HRT** benefits in this case is the **prevention of osteoporosis**. |
| Key 56 | **A 73-year-old woman feeling unwell has longstanding Rheumatoid Arthritis with right swollen hot tense knee. Initial investigation of choice?**<br>a. Arthroscopy<br>b. **Aspirate of joint fluid for microscopy and culture**.<br>c. FBC ESR<br>d. MRI<br>e. X Ray<br><br>**Septic Arthritis**<br><br>**Monoarthritis** = Single joint involvement (commonly **Knee**)<br>**Fever**/ **Pain**/ **Swelling**/ **Limited movement**<br><br>+ A **Risk factor** (e.g. **DM**, **Steroid**, **HIV**, **Rheumatoid Arthritis**) "important √"<br>Think of → **Septic Arthritis**<br>♦ The commonest causative organism → **Staphylococcus Aureus**.<br>♦ A common organism in young SEXUALLY active → N. Gonorrhea. |

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| | ♦ **Dx**<br><br>√ ***Aspiration of Synovial Fluid*** → send for staining, microscopy, WBC count, Culture.<br><br>√ ***Blood Culture***.<br><br>♦ **Management**<br><br>√ **Flucloxacillin** (for 4-6 weeks) "first-line" "like cellulitis"<br><br>√ If penicillin allergic → **Clindamycin**.<br><br>√ If the causative organism is N. Gonorrhea nor Staph → **Cefotaxime** or **Ceftriaxone**.<br><br>√ If still not responding → **Repeated percutaneous aspiration**.<br><br>"*IV antibiotics for 1 week until blood cultures become -ve and swelling resolves*<br><br>*Then, Oral antibiotics for 4 weeks*"<br><br>◙ **Note, do not forget (DM, RA) as risk factors for Septic Arthritis.** |
| Key 57 | **Perthes' disease**<br><br>◘ Perthes' diseas' is a degenerative 'ondition affecting the **hip** joints of **children**, typically between the ages of **3-9 years**. |

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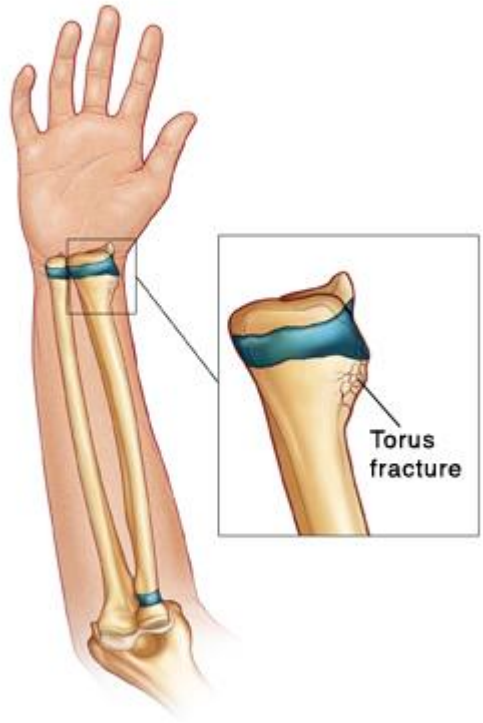
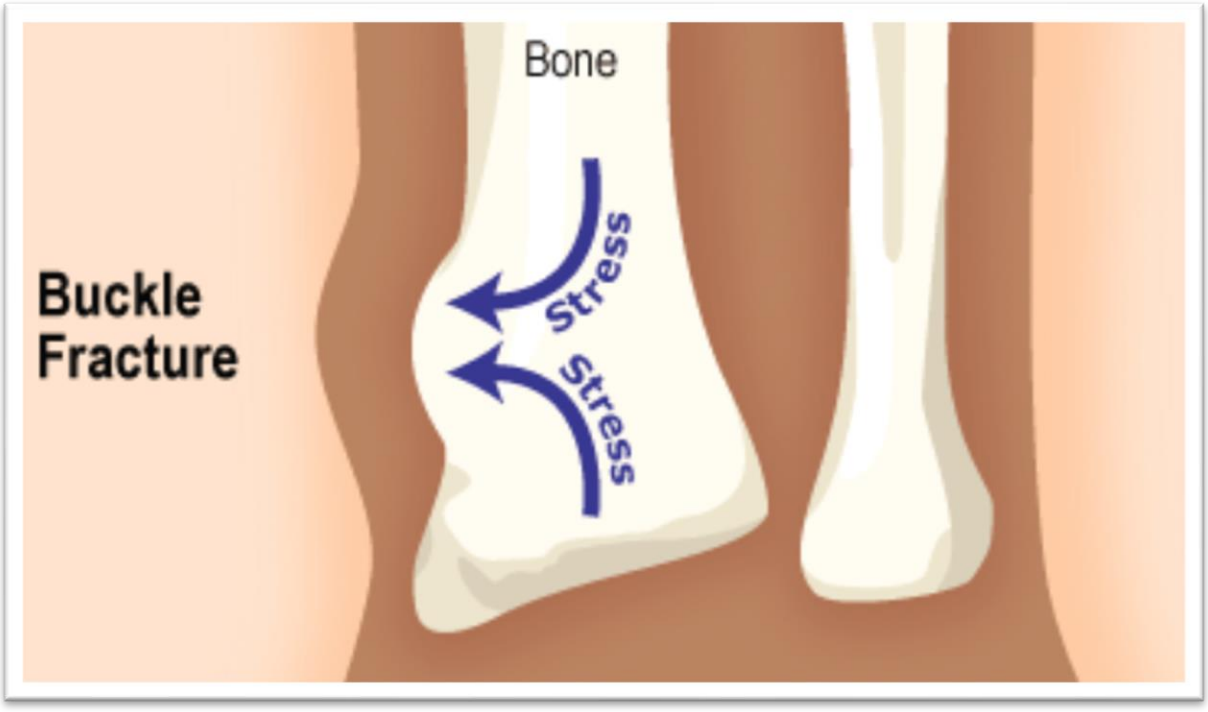
| | ◘ It is due to avascular necrosis of the femoral head, specifically the femoral epiphysis. Impaired blood supply to the femoral head causes bone infarction.<br><br>◘ Perthes' disease is 5 times more co'mon in **boys**. Around 10% of cases are bilateral.<br><br>**◙ Features**<br><br>**√ Hip pain**: develops progressively over weeks-months.<br><br>**√ Limping.**<br><br>**√** Stiffness and **reduced range of hip movement.**<br><br>**√ X-ray**: early changes include widening of joint space, later changes include decreased femoral head size/flattening, radiolucency of the proximal metaphysis.<br><br>**DDx according to age:**<br><br>• **< 3 years** → Developmental dysplasia of the hip (usually girl, breech presentation) ▌toddler's fracture e.g. spiral injury, may not be seen on X-ray.<br><br>• **3-9 years** → Perthes disease (Chronic, stiffness, flattening on x-ray).<br><br>• **> 9 YO** → Slipped upper femoral epiphysis (boy, shorter leg, limping). |
| Key 58 | **Torus (Buckle) Fracture.** |



Buckle, or torus, fractures are incomplete fractures of the shaft of a long bone that is characterised by bulging of the cortex. They typically occur in **children aged 5-10 years**.

As they are typically self-limiting, they do not usually require operative intervention and can sometimes be managed with splinting and immobilisation rather than a cast.

## Scenario:

**An 8 YO boy fell on his outstretched right hand and presents with marked pain, swelling and bruising of his right hand and wrist. There is no neurovascular deficit. What is the most likely fracture to be seen on X-ray?**

→ **Buckling of the distal radius**.

√ As children have more elastic bones than adults, the buckling (not full fracture, leaving a cortex portion intact) is common among children.

√ The most common type of fracture in childhood is buckle (torus) fracture.

√ The most common site is → distal radius.

Key 59

**Bone pain + ↑ Alkaline Phosphatase (ALP) + Multifocal Sclerotic patches on X-Ray ± HF (e.g. shortness of breath on exertion).**

→ **Paget's disease**. (the other name is "**Osteitis Deformans**").

**The diagnosis of Paget's disease of the bone is a combination of**

**√** High alkaline phosphatase (↑ ALP), and:

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| | √ X-ray findings usually reveal a mixture of:<br>Sclerotic lesions, Lytic lesions, Coarsened trabecular pattern. |

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| Key 60 | **Injury to the knee:**<br>♦ **Locking** (Locked leg = cannot bend or straighten leg) → **Meniscal tear**.<br>♦ **+ve Apley and McMurray tests** → **Meniscal tear**.<br>**Imp √**, meniscal tears are best seen by → **MRI scan**<br>**For knowledge:**<br>**Apley test:**<br>It involves placing the patient in the prone position with the knee flexed to 90 degrees. The patient's thigh is then rooted to t'e examining table with the examiner's knee. The examiner latera'ly and medially rotates the tibia, combined first with distraction, while noting any excessive movement, restriction or discomfort. The process is then repeated using compression instead of distraction. If rotation plus distraction is more painful or shows increased rotation relative to the normal side, the lesion is most likely to be ligamentous. If the rotation plus compression is more painful or shows decreased rotation relative to the normal side, the lesion is most likely to be a meniscus injury.<br>**McMurray test:**<br>With the patient supine, the examiner holds the knee and palpates the joint line with one hand, thumb on one side and fingers on the other, whilst the other hand |

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| | holds the sole of the foot and acts to support the limb and provide the required movement through range. From a position of maximal flexion, extend the knee with internal rotation (IR) of the tibia and a VARUS stress, then return to maximal flexion and extend the knee with external rotation (ER) of the tibia and a VALGUS stress. The IR of the tibia followed by extension, the examiner can test the entire posterior horn to the middle segment of the meniscus. The anterior portion of the meniscus is not easily tested because the pressure to that part of the meniscus is not as great.<br><br>IR of the tibia + Varus stress = lateral meniscus<br><br>ER of the tibia + Valgus stress = medial meniscus<br><br>Positive findings: Pain, snapping, audible clicking or locking can indicate a compromised meniscus.<br><br>*You can find many YouTube videos explaining these tests.* |
| Key 61 | **An osteoarthritis patient on paracetamol and topical NSAIDs but the pain is still ongoing. The patient has a recent peptic ulcer. What to do?**<br><br>→ **Prescribe a weak opioid e.g., Codeine**.<br><br>• "Codeine is preferred over tramadol as it is weaker".<br>• No need for knee X-ray if the Dx is clinically obvious.<br>• Although the next step is oral NSAIDs e.g., naproxen, this patient has a recent peptic ulcer, so we do not prescribe oral NSAIDs.<br><br>**Osteoarthritis Rx:** |

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| | Paracetamol → + topical NSAIDs → + oral NSAIDs **OR** weak opioid "codeine"<br><br>If codeine is not effective or have side effects eg, constipation:<br>→ Switch from codeine to tramadol (100 mg twice a day).<br><br>Tramadol is indicated for moderate to severe pain and can be used for an extended period; codeine is indicated for mild to moderate pain. |
| Key 62 | ◙ A swelling behind the knee (in the popliteal fossa), usually asymptomatic, round, smooth, non-tender → **Baker cyst (popliteal cyst)**<br><br>◙ An osteoarthritis patient with a Hx of right popliteal mass (was present for 3 weeks then subsided) now presents with right calf pain, swelling, erythema and tenderness.<br>Think → **Baker's cyst rupture**.<br><br>"There is an association between osteoarthritis and baker cyst". |
| Key 63 | **Hip dislocation:**<br><br>• It can occur as a complication of hip replacement surgery.<br>• The affected leg is shorter and externally rotated.<br>• Important advice for patients who have done hip replacement is not to bend the hip more than 90 degrees for 6 weeks post-operatively (e.g., not to try to tie their shoes, or sit on a low toilet seat).<br>• Investigation → **X-ray of hips** "not MRI". |

Key 64

# Compartment Syndrome

• It is painful and potentially serious condition caused by bleeding or swelling within an enclosed bundle of muscles

**Summary** → History of trauma/ compression of a limb. Very **painful** and very **tense** muscles bundle. **Passive movement** of fingers/ toes of the affected limb leads to a significant pain. **Morphine** is **NOT** so helpful in relieving pain. **Distal pulses** can be felt, and their presence does **NOT** exclude the diagnosis of compartment syndrome.

√ It is an emergency → Measure the intracompartmental pressures and take to theatre for urgent fasciotomy.

√ If it develops after applying a plaster cast → Loosen or split the plaster cast.

• **Examples**: It can occur after a traumatic injury (e.g., car crush, a heavy blow or kick to muscles), Prolonged compression (a limb stuck under a heavy object). It can also occur as a complication of casting or dressing a fracture.

• This leads to severely high pressure within the compartment, leading to insufficient blood supply to the muscles and nerves.

• **Important Note**: The presence of **pulse** on the affected limb **does not** exclude compartment syndrome.

• **Important Clue**: The **pain** is very severe and is usually **not** relieved even with increasing morphine doses! √

• **Important Clue**: Passive movement of toes/fingers of the affected limb leads to → ↑ pain. √

• Compartment Syndrome is a clinical diagnosis; however, **taking the measurements of intra-compartment pressure is useful in diagnosis**. This is done by a device called (Handheld Intra-compartmental Pressure Monitor).


***Handheld Intracompartmental Pressure Monitor System:***

*- The needle of the device is placed in the compartment of the limb to measure the pressure.*

*- If the pressure in any intercompartment is* ***> 30 mmHg*** → ***Fasciotomy***.

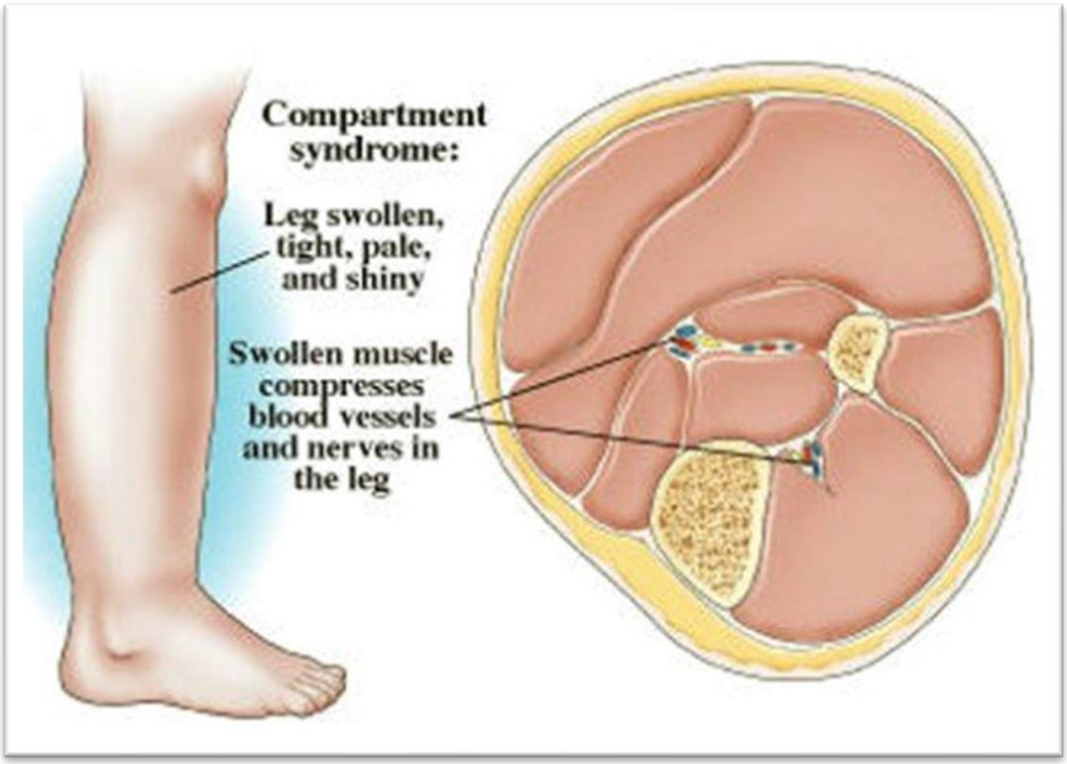
• Acute compartment syndrome is a **medical emergency** that requires surgery (**Urgent Fasciotomy**) to be corrected.

• If untreated, the lack of blood supply can result in permanent damage to the muscles and nerves. Thus, loss of function of the affected limb. Ultimately, amputation may be required if the limb becomes necrotic.

• Death of muscle group may result within 4 to 6 hours..

• **Note** that the pulses of the affected limp are usually felt; absence of pulses is a very late sign. So, the presence of distal pulses does NOT rule out compartment syndrome.

• **Note**: **Myoglobinuria** may result **after fasciotomy** which may lead to **renal failure**. Therefore, **aggressive IV fluid** is required if myoglobinuria develops.




## *Example (1)*:

**A football player was kicked to his left calf and presented with severe pain. He was given morphine but still in pain. His calf is bruised and swollen. Passive movements of his toes aggravate the pain. He has weak pulse on his dorsalis pedis and posterior tibial arteries but still felt. X-ray is normal.**

**The likely Dx → Compartment syndrome.**

**The most appropriate action → Urgent fasciotomy.**

If fasciotomy is not among the given options, and there is an option for

→ **Measuring the intracompartmental pressure**, pick it.

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## Example (2):

A 33-year-old man had a car accident that resulted in left tibial shaft fracture. He had undergone intramedullary nails for a limb stabilisation and a Plaster of Paris was applied. The next day, he developed a severe pain in his left calf. He was given IV morphine but the pain is still significant. His left calf feels very tense. There is significant pain on passive stretching of his left toes. The distal pulses (pedal and posterior tibial pulses) are palpable on the left foot. The cast was removed but the pain is still significant. There is an altered sensation in his left calf compared to his right. What is the most appropriate action?

A) Increase the morphine dose.

B) Re-apply the Plaster of Paris.

C) Measure the intracompartmental pressures.

D) Perform ultrasound doppler of the left leg.

E) Give LMWH and apply compressing dressings.

**Answer → C.**

**This is a case of Compartment Syndrome**

History of trauma/ compression of a limb. Very **painful** and very **tense** muscles bundle. **Passive movement** of fingers/ toes of the affected limb leads to a significant pain. **Morphine** is **NOT** so helpful in relieving pain. **Distal pulses** can be felt and their presence does **NOT** exclude the diagnosis of compartment

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| | syndrome. It is an emergency → **Measure the intra-compartmental pressures** and take patient to theatre for **urgent fasciotomy**. |
| Key 65 | ***Example (1):***<br><br>**A 60 YO man has had a distal radial fracture 2 years ago. He does not smoke, and drinks 4 units of alcohol a week. His BMI is 22 kg/m2. He would like to decrease his risk of fractures in the future. What is the appropriate action?**<br><br>→ **DEXA scan**.<br><br>**√** Anyone who is > 50 YO with a Hx of fragility fracture should be assessed for *osteoporosis* by DEXA scan.<br><br>**√** If the result of the DEXA scan shows a bone mineral density T-score is -2.5 or less, he would be given bisphosphonate.<br><br>**√ Fragility fracture** is a fracture that results from a low-level trauma that usually does not cause a fracture (commonly seen is vertebrae, **proximal femur**, **distal radius**). |

**Important Q:**

**What If he has risk factors for osteoporosis (e.g., smoking, DM, prolonged use of corticosteroids, low BMI, heavy alcohol) but has not had fragility fracture??**

In this case, we would initially do a (**fracture risk assessment**) e.g., (**calculate the patient's 10-year major osteoporotic fracture risk using a fracture risk assessment tool**).

**If the result is ≥ 10% → go for DEXA scan. If T-score ≤ 2.5 → bisphosphonates**

*Example (2):*

**A 60 YO man wants advice to decrease his risk of osteoporotic fracture. He is a smoker. His BMI is 17.5. He has DM. He has no Hx of fractures but his father had hip fracture.**

→ **Calculate the patient's 10-year major osteoporotic fracture risk using a fracture risk assessment tool.**

√ Although he is > 50 YO, he does not have Hx of fragility fracture.

√ He has risk factors for osteoporosis (DM, smoking, a bit low BMI), he would benefit from fracture risk assessment first. If this came 10% or more, we would proceed to DEXA scan.

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| Key 66 | **A 62 YO man has had a proximal femur fracture 6 months ago. He does not smoke, and drinks 4 units of alcohol a week. His BMI is 22 kg/m2. His estimated calcium intake is 400 mg a day. He has done DEXA scan and his T-score is -2.2. What is the most appropriate action?**<br><br>→ **Start calcium and vitamin D tablets.**<br><br>√ Anyone who is > 50 YO with a Hx of fragility fracture should be assessed for *osteoporosis* by DEXA scan. He has a fragility fracture (**proximal femur**).<br><br>√ His t score is **still above -2.5**, thus, he would **not** be given bisphosphonate.<br><br>√ For **adults**, the recommended intake of calcium is **700 mg/day**.<br><br>√ For people **at risk of fragility fracture**, the recommended intake of calcium is at least **1000 mg/day**.<br><br>√ NICE suggest using both **calcium + vit. D** if calcium intake is insufficient. |
| Key 67 | **Fascia iliaca compartment block**<br><br>The fascia iliaca compartment block, is described for blocking the femoral, lateral cutaneous, and obturator nerves. The technique consists of injecting a |

local anesthetic immediately behind the fascia iliaca at the junction of the lateral and middle thirds of the inguinal ligament, and massaging the local anaesthetic upwards.

Ultrasound (US) guided blocks are more effective and safer and should be performed if equipment and expertise are available

## Indications

√ **Femur fractures** of any aetiology.

√ Anterior thigh wounds requiring exploration and washout.

## Contraindications

√ If the patient is on anticoagulation (risk of bleeding from the long needle) that may cause large hematoma.

√ Local anaesthetic allergy/anaphylaxis

√ Open wound or signs of infection at likely injection site

## *Example (1):*

A 72 YO man fell down and presents with severe right hip pain. X-ray shows a right femoral neck fracture. ECG shows atrial fibrillation. He was given IV morphine as a bolus but still in severe pain. His pulse rate is 88 and respiratory rate is 11 breaths per minute. The plan is to take him to the theatre for an open reduction and internal fixation. What should be done now?

→ **Fascia iliaca compartment block**.

√ He has femur neck fracture.

√ He is still in severe pain.

√ He has no contraindications for fascia iliaca compartment block (even though he has AF, he is not on anticoagulation therapy. AF is not a contraindication for fascia iliaca nerve block or general anaesthesia.

√ It is dangerous to add more morphine as it can cause respiratory depression and his RR is already 11.

√ If he was a young patient and had road traffic accident that led to fractured femur, he would need to be taken immediately to the theatre on the same day because of the fear of avascular necrosis of the femoral head.

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## *Example (2):*

A 72 YO man fell down and presents with severe right hip pain. X-ray shows a right femoral neck fracture. ECG shows atrial fibrillation. He was given IV paracetamol but is still in severe pain. His pulse rate is 88 and respiratory rate is 18 breaths per minute. He is on rivaroxaban and his INR is 2. What should be done now?

→ **IV morphine**.

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| | √ Firstly, he has not been given morphine (he was given paracetamol). He is still in severe pain.<br><br>√ Secondly, it is dangerous to do fascia iliaca compartment block as he has a contraindication which is (**he is on anticoagulation**; rivaroxaban) for risk of bleeding. |
| Key 68 | **Distal radius fractures** (even if minimal displacement)<br><br>**Rx** → Closed Reduction<br><br>**Then** → Below elbow backslap "for immobilisation". |
| Key 69 | **After moving to a new house and lifting heavy objects, a 30 YO man presents with back pain around the level of L3. There are no other complaints. Examinations are normal.**<br><br>→ **Take over the counter analgesics and continue to mobilize.**<br><br>Do not advise to rest for mild musculoskeletal pain or myofascial pain. Rest would cause spasm and prolonged pain while keep mobilising would help muscles to return to normal sooner. |
| Key 70 | **A 60 YO woman fell down and had a neck of femur fracture. She is due for surgery the next day. He Hb is 76 g/L. What should be done?** |

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| | → **Transfuse Blood and Proceed with the surgery**.<br><br>**Hip surgery is NOT elective. The sooner the surgery, the better the results.**<br><br>**Her Hb is 76 g/L (ie, 7.6 mg/dl)**<br><br>**◙ Elective Surgery:**<br><br>♠ **If Hb is < 10** → Delay "defer" "Postpone" the surgery and Investigate for the anemia reasons first.<br><br>♠ **If Hb is < 8** → Transfuse Blood and also Defer the surgery.<br><br>**◙ Emergency Surgery:**<br><br>♠ **If Hb is < 10** → Proceed with the surgery.<br><br>♠ **If Hb is < 8** → Transfuse Blood and Proceed with the surgery. |
| Key 71 | **Supraspinatus Tendinitis**<br><br>√ The supraspinatus muscle is a part of the rotator cuff muscles.<br><br>√ It initiates arm abduction.<br><br>√ Classic sign is → **painful arc in resisted abduction between 60-90 degree**.<br><br>√ **Passive abduction** is **normal** "no pain".<br><br>√ **External rotation** of the arm is **normal** "no pain".<br><br>√ It commonly affects athletes. |

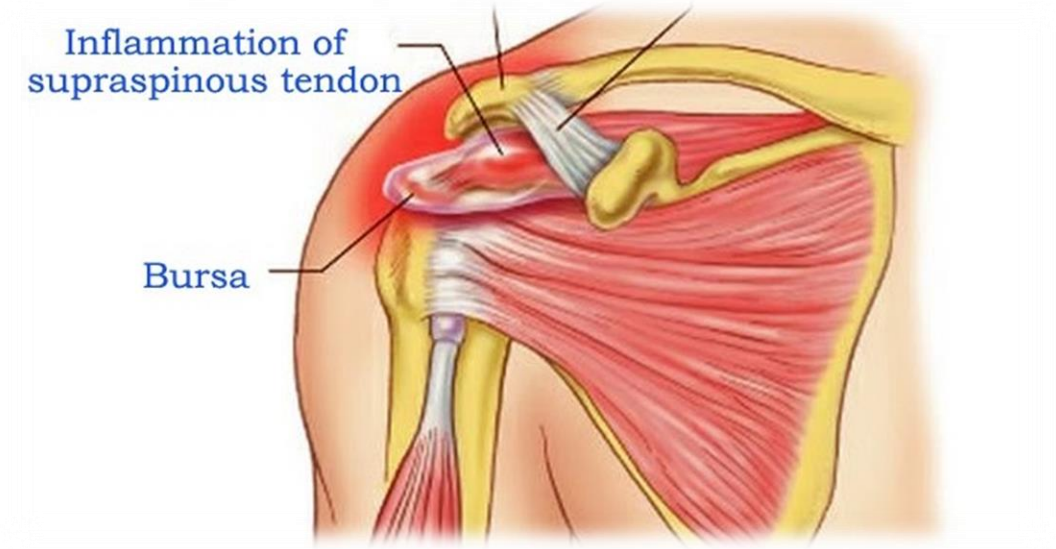
## Adhesive capsulitis (Frozen shoulder)

- Both **passive** and **active** movements of shoulder are **painful**.
- **External rotation** of arm is **impaired**.

## Example:

A 30 YO female presents complaining of painful left shoulder for a few months. Her pain started after joining a gym and lifting heavyweights. She cannot lift her left arm over her shoulder due to pain. There is no muscle wasting. O/E, pain is present when she abducts her left arm to 80 degrees. There is no pain when she externally rotates her left arm. There is no reduction in passive movements of glenohumeral joint.

The most likely Dx → **Supraspinatus tendinitis**.




Key 72

## Spinal Stenosis

• Compression of spinal cord → Spinal Claudication (leg pain that is **worse** when standing or walking, and **improves** with sitting or bending forwards -flex-).

• **Causes:**

- Degenerative “the commonest cause”

- Wear and tear in the vertebrae due osteoarthritis

- Herniated disc.

- Spondylolisthesis (slipping of vertebrae).

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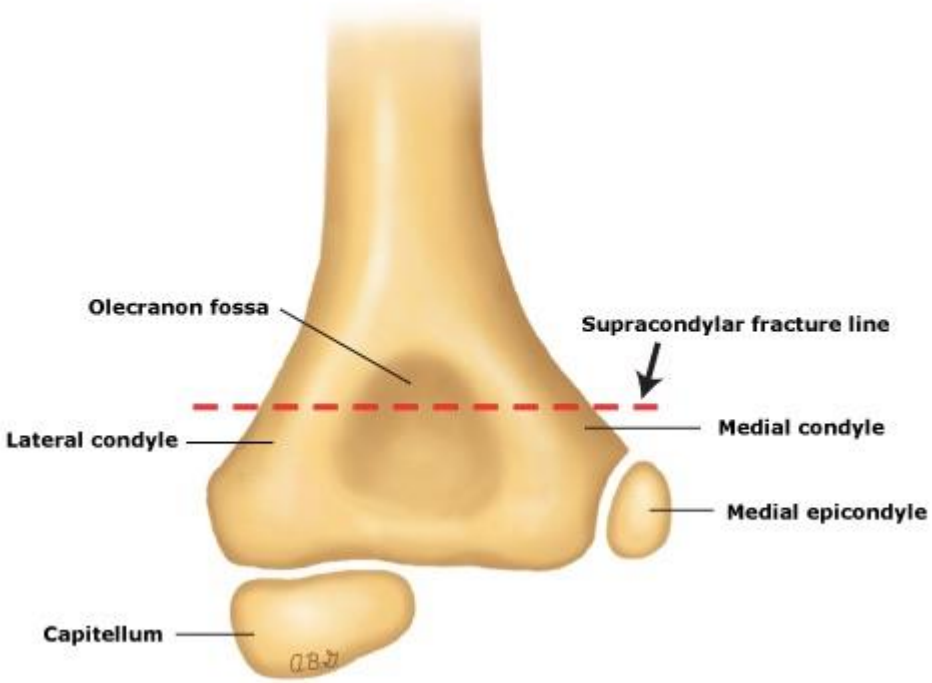
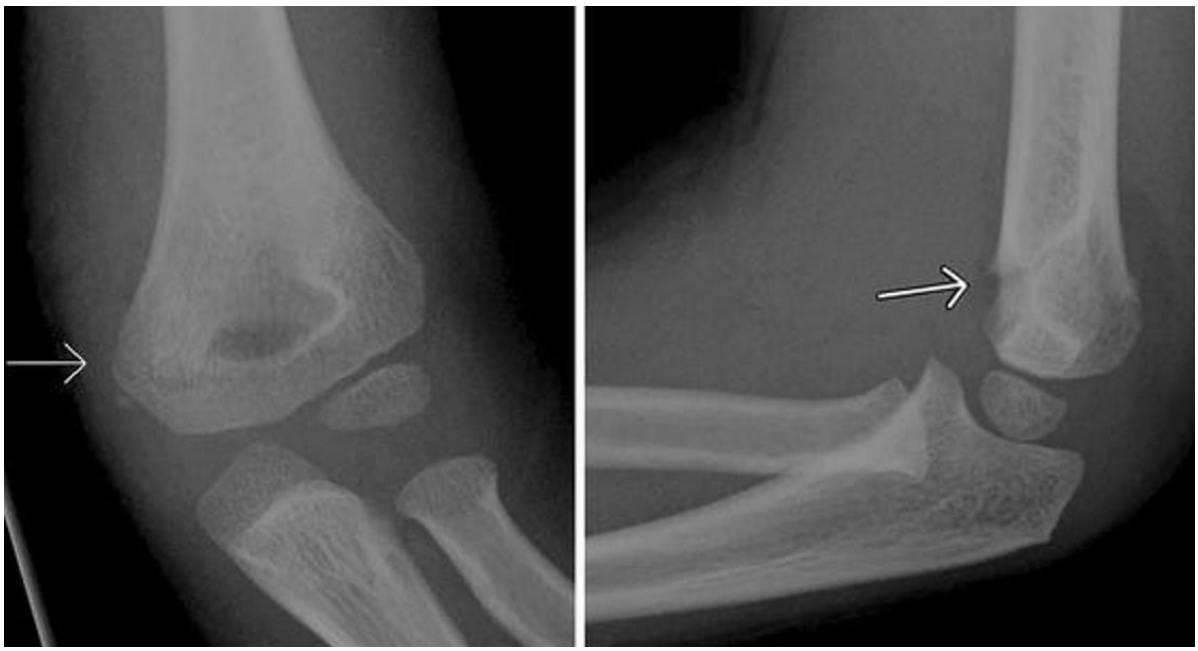
| | • **Spinal claudication description:**<br>√ **Leg pain** that is **worse on long-standing or walking** (eg, starts 10 minutes after standing) and **improves by sitting or bending forwards**.<br>√ Radical radiated pain the dermatome distribution.<br>√ The leg pain can be unilateral or bilateral. It can involve back, buttocks, thighs, and spread to feet.<br>• **Investigation of choice** → Magnetic Resonance Imaging (MRI). √ **imp**. |
| Key 73 | **Supracondylar Fracture of the Humerus**<br>• One of the most common fractures in **children**.<br>• **Features**:<br>√ Painful, tender and swollen elbow (inability to move elbow due to pain).<br>√ Inability to supinate forearm or fully extend elbow.<br>√ Cubitus varus is common.<br>√ Hand numbness (due to compression on ulnar, radial or median nerves).<br>√ Hand coldness/ cyanosis (due to compression on brachial artery). |



Supracondylar fracture of Humerus.

Supracondylar fracture of Humerus.

Key 74

## Important Note on Managing Sciatica Pain and some DDx:

- Sharp shooting pain (neural pain) is usually managed with: **Gabapentin**.

**Neuropathic pain** can present in any form of the following:

(**Burning**), (**Tingling**), (**Numbness**), (**Itching**), (**Paraesthesia**), (**Shooting/ Stabbing**)

**Example**, a diabetic patient with ankle ulcer with agonising Burning Pain.

Rx? → **Amitriptyline** (1st line) **or** Gabapentin **or** Duloxetine **or** Pregabalin.

***A****way* ***G****oes* ***D*** *neuropathic* ***P****ain*

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## HOWEVER:

◙ In Chronic **Sciatica** (Back pain that is sharp and shooting and radiates to lower limb -**without** urinary retention or fecal incontinence-)

→ Use simple analgesia and raise up in the ladder:

→ Paracetamol, NSAIDs, Codeine.

• In a recent exam, the answer was **codeine**, as the patient was already on paracetamol and Ibuprofen with no pain control.

• Gabapentin is not useful in sciatica pain; some say it is even harmful.

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| | ◙ Note that back pain that radiates to lower limb + urinary retention + fecal incontinence → Cauda equina syndrome<br>→ **Urgent referral to Orthopedics**<br>(For **Urgent MRI** and **Urgent surgical decompression**). |
| Key 75 | **Notes on Managing Back Pain**:<br>• **Paracetamol** alone is **not** recommended by NICE CKS to manage **back pain** as it does very little to manage back pain (ineffective).<br>• Start with a **NSAIDs** (eg, **Naproxen**) especially if **mild-moderate back pain**.<br>• Another valid option for back pain is **codeine** (given after trying NSADs, and if the pain is more severe). |
| Key 76 | **Summary of Compartment Syndrome**<br>◘ Hx of trauma/ compression of a limb (eg, accident, casting, heavy blow to a limb).<br>◘ Very painful and very tense bundle of muscles (eg, calf).<br>◘ Passive movement of fingers/ toes of the affected limb leads to a ↑ pain.<br>◘ Morphine is **NOT** so useful in relieving pain.<br>◘ Distal pulses can be felt**,** and their presence **does NOT** exclude the diagnosis of compartment syndrome.<br>◘ It is an emergency condition → Take Intracompartment pressure measurements<br>and take the patient to theatre for urgent fasciotomy. |

◘ If myoglobinuria developed → Aggressive IV fluids (to prevent renal failure).

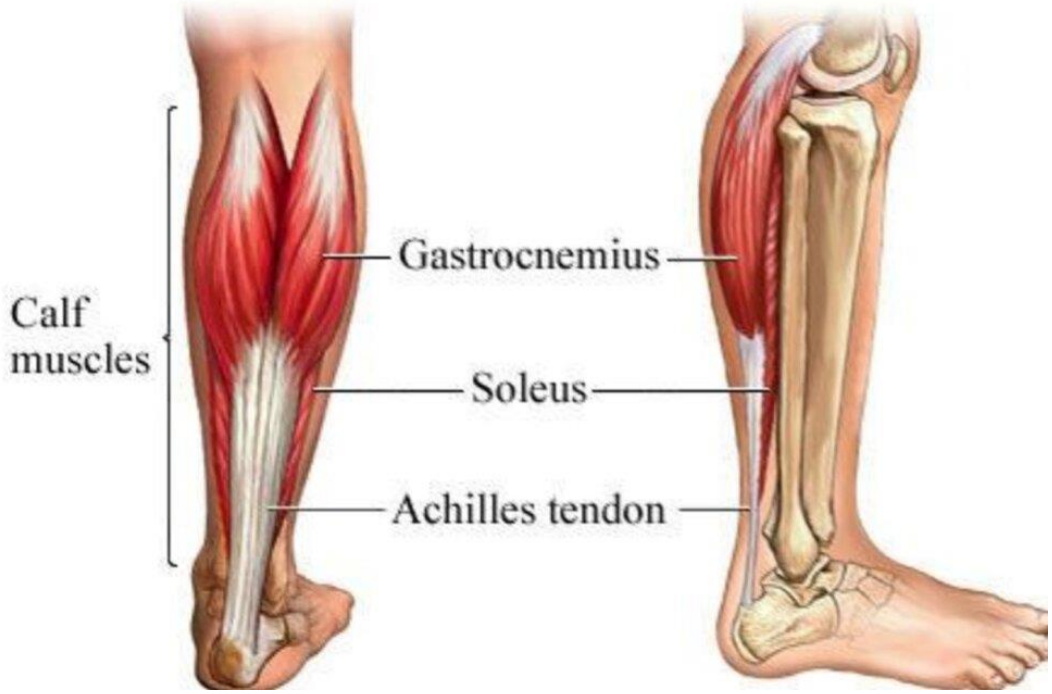

Key 77

**What is the affected muscle in Achilles tendon rupture?**

***"Suddenly felt a shot at the back of his leg followed by pain at his calf".***

***"Squeezing the calf results in → Absent plantar reflex".***

→ **Gastrocnemius** (The bulk of calf muscles).



Key 78

## Vertebral Osteomyelitis

- Infection of bone, often caused by bacteria, mainly staphylococcus Aureus.
- **Risk factors**: Diabetes, immunocompromised, open fracture, recent trauma.
- **Clinical features:**

√ Acute onset of pain in the affected bone.

√ Swelling, erythema and warmth overlying the affected bone.

√ Fever.

- **What is the best modality to diagnose vertebral osteomyelitis?**

→ **MRI of the spine**. Others → blood cultures.

- *Note that one of the complications of **staphylococcus aureus** bacteremia is distant spread via haematogenous route causing infections like vertebral **osteomyelitis**.*
- **Management** → IV antibiotics (Flucloxacillin).

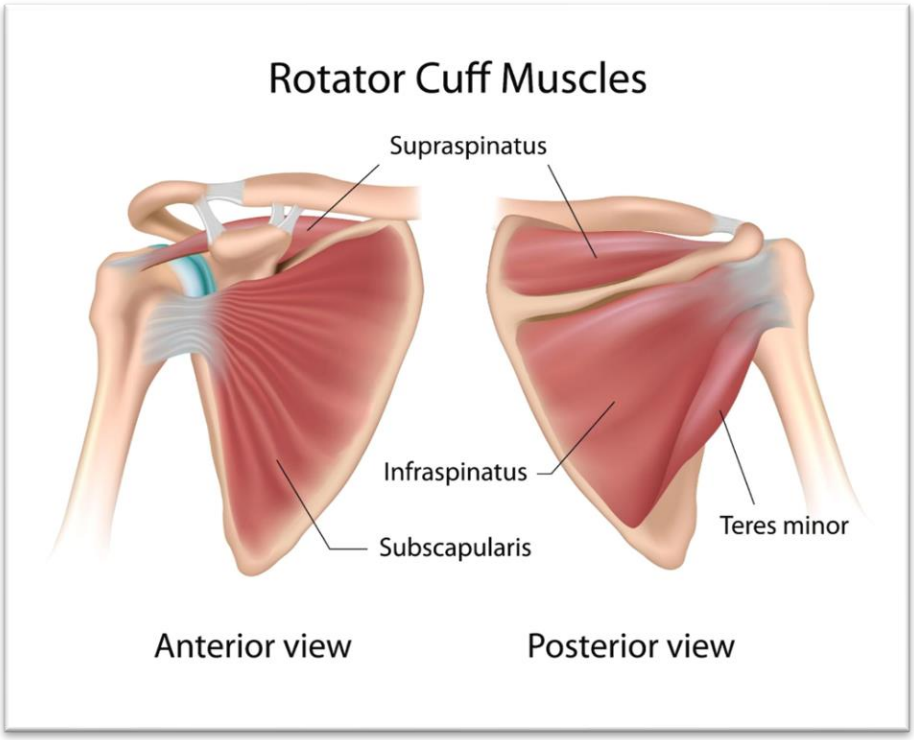
Key 79

## What is the most common muscle involved in rotator cuff tears?

→ **Supraspinatus**.

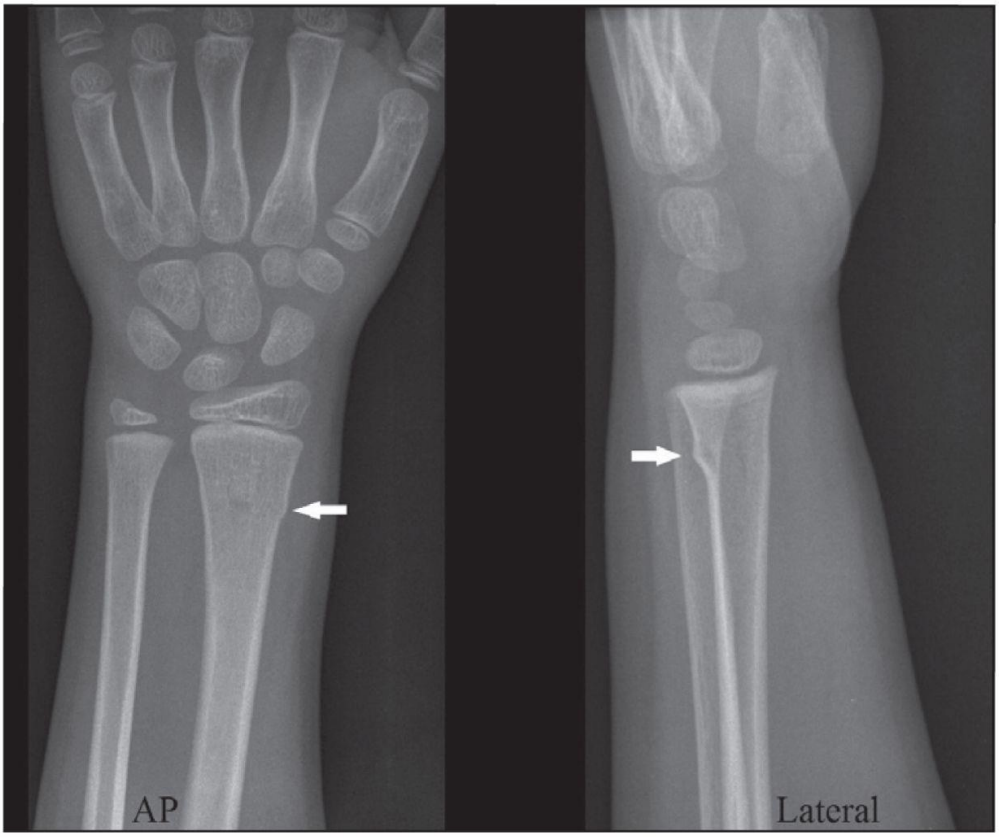
**Supraspinatus muscle** is the most involved muscle in rotator cuff tears, especially in patients who present with **pain on abduction and external**

**rotation of the arm**. There is usually **tenderness over the anterior aspect** of the **shoulder**.



Key 80

## Buckle Fracture (Torus Fracture)




- Common in children due to the relative flexibility of their bones.
- Commonly seen in the distal radius after a fall on an outstretched hand.
- Tenderness, Pain and ± swelling over the distal radius.
- Rx → In this case, alignment is maintained, and therefore, no immediate orthopaedic intervention is required other than immobilisation.

Key 81

## Initial Assessment of Acute Vertebral Pain in Elderly Osteoporotic Patients

• An elderly patient with a history of osteoporosis experienced sudden severe vertebral (eg, thoracic vertebral) pain after a physical exertion. The pain, localized to the thoracic region, necessitates prompt investigation to rule out vertebral fractures, which are a common concern in osteoporotic individuals.

• In such cases, the most appropriate **initial** diagnostic tool is

→ X-ray of the thoracic spine. This is due to its efficiency and effectiveness in detecting fractures.

• Although MRI can offer more detailed imaging, an X-ray is typically the first step in a clinical setting for its practicality. Should the X-ray be inconclusive or suggest more complex issues, further imaging with MRI might be warranted.

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***Clinical Scenario:***

- Elderly patient with osteoporosis.
- Sudden onset of sharp thoracic pain following physical exertion (eg, lifting).
- Pain localized to thoracic region.
- History of medication for osteoporosis (e.g., alendronate).

***Examination Findings:***

- Tenderness over thoracic vertebrae.
- No visible bruising or deformity.

- Normal neurological examination.

***Initial Investigation:***

- **Preferred Test → X-ray of the Thoracic Spine.**
  - Readily available and cost-effective.
  - First-line imaging to evaluate new onset back pain.
  - Useful in identifying vertebral fractures.
  - Especially indicated in the context of trauma or physical exertion.

***Follow-Up Considerations:***

- If X-ray results are inconclusive or complex fractures are suspected, MRI may be considered for detailed assessment.
- MRI can be used if complications develop or if further investigation is necessary after initial X-ray.

## Sudden vertebral pain in a patient with osteoporosis (Summary)

• **X-ray** is the most appropriate **initial test** for sudden vertebral pain in osteoporotic patients (as they are at high risk of fractures). This is especially if the pain started after trauma (eg, a fall) or lifting heavy objects.

• MRI may be used for more detailed evaluation if required.

• Although **MRI** can offer more detailed imaging, an X-ray is typically the first step in a clinical setting for its practicality. Should the X-ray be inconclusive or suggest more complex issues, further imaging with MRI might be warranted.

Key 82

## Evaluating Knee Locking: Imaging for Meniscal Tears

A 36-year-old woman presents with a 4-week history of intermittent pain in her left knee, particularly after twisting movements or deep squats. She reports occasional sensations of "catching/locking" in the knee and swelling after prolonged activity. She denies any prior significant injury but recalls a minor fall while hiking 5 weeks ago. Upon examination, there is mild swelling and tenderness along the joint line. McMurray's test elicits a noticeable click with discomfort. There is no joint instability, and her range of motion is largely preserved. What is the most appropriate imaging modality for further investigation?

A) Ultrasound of the knee.

B) CT scan of the knee.

C) Arthroscopy.

D) MRI of the knee.

E) Plain X-ray of the knee.

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**Answer → D) MRI of the knee.**

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| | • The patient's presentation suggests a potential **meniscal injury**, which is characterized by intermittent pain, catching or locking sensations, and positive McMurray's test findings.<br><br>• **MRI of the knee** is considered the gold standard for diagnosing soft tissue injuries of the knee, including meniscal tears, ligament damage, and cartilage abnormalities. It provides a detailed view of both soft tissue and bone, which makes it ideal for this situation. |
| Key 83 | **Spot Diagnosis: A Fall Directly on Elbow:**<br><br>  |

The image shows swelling over the elbow region, which is characteristic of

→ **Olecranon Bursitis**.

◙ **Definition:**

Olecranon bursitis is the inflammation of the bursa located over the olecranon process at the elbow. The bursa acts as a cushion between the bone and the skin, reducing friction during movement. When it becomes irritated or inflamed, it fills with fluid, causing swelling, pain, and limited movement of the elbow.

◙ **First-line Management:**

1. **Conservative Management**: → Compression bandage and ice application.
   - **Rest**: Avoid activities that exacerbate the symptoms.
   - **Ice application**: Apply ice packs intermittently to reduce swelling and inflammation.
   - **Compression**: Using an elbow pad or compressive wrap can help reduce swelling.
   - **Elevation**: Elevate the arm to reduce swelling when possible.
2. **NSAIDs**: Non-steroidal anti-inflammatory drugs (such as ibuprofen or naproxen) to reduce pain and inflammation.

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| | 3. **Aspiration** (if necessary): If the swelling is significant or persistent, aspiration of the fluid may be considered for relief and diagnostic purposes (to check for infection).<br>4. **Infection management** (if suspected): If there is any concern for septic bursitis (e.g., warmth, redness, systemic symptoms), antibiotics may be required after aspiration and culture.<br><br>If conservative treatment fails or infection is suspected, referral to a specialist may be necessary. |
| Key 84 | **Distal Radius Fracture Management (Scenario-Based Key Points)**<br><br>❖ **Patient Presentation**:<br>○ 54-year-old man, 3 weeks post minimally displaced distal radius fracture.<br>○ Treated initially with a cast (3 weeks ago).<br>○ Now presents with stiffness, mild discomfort, weakness, no significant pain.<br>❖ **Examination**:<br>○ Warm, well-perfused fingers.<br>○ No swelling or concerning symptoms like severe pain, swelling, or discoloration.<br>❖ **Management?** |

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| | ○ → **Advise physiotherapy** to address stiffness and promote recovery.<br>○ Encourage finger movement for range of motion, joint health, and circulation.<br>○ Pain is likely due to immobilisation, not a serious complication.<br>❖ **Red Flags for Immediate Action**:<br>○ Severe pain, significant swelling, discoloration, or loss of sensation would suggest complications like **compartment syndrome**, requiring urgent cast removal. |
| Key 85 | **Acute Flare of Osteoarthritis (Scenario-Based Key Points)**<br>❖ **Patient Presentation**:<br>○ 57-year-old woman, 12-month history of wrist pain (osteoarthritis).<br>○ Recent worsening with pain, stiffness, swelling, particularly after movement.<br>❖ **Examination**:<br>○ Joint space narrowing, osteophyte formation on radiographs.<br>○ Blood tests negative for rheumatoid factor and anti-CCP.<br>❖ **Management**:<br>○ **Corticosteroid injection** is the most effective for rapid relief of acute flare symptoms.<br>○ Provides short-term relief (2-10 weeks) for pain and inflammation. |

- Over-the-counter **NSAIDs** (e.g., ibuprofen) can be used initially but may not always control severe flares.

❖ **Long-term Management**:

- **Physiotherapy** can improve joint function and strength but is not the best choice for acute flares. (Pick physiotherapy if the pain is mild, as it is more useful for improving the range of motion. However, in significant pain and tenderness acute flare of osteoarthritis, pick corticosteroid injection).
- Avoid glucosamine and acupuncture as they are not recommended for symptom relief in osteoarthritis (according to NICE guidelines).

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**Important Question: When should physiotherapy be chosen over corticosteroid injections in osteoarthritis management?**

❖ **Physiotherapy** is recommended for patients with mild to moderate osteoarthritis who experience stiffness and reduced range of motion **without** severe pain. It helps improve joint function and mobility, and provides long-term benefits by strengthening muscles and stabilising joints.

❖ **Corticosteroid injections** are more appropriate for patients with moderate to severe pain that significantly impacts daily activities, or when inflammation is present. They offer faster pain relief, especially when conservative treatments like physiotherapy and analgesia have not been effective. Injections are particularly useful for focal pain and can provide short- to medium-term relief.

Key 86

## A Scenario on A Previous Topic

A 30-year-old woman, 10 weeks postpartum, presents to the clinic complaining of persistent pain and swelling on the radial side of her right wrist. She reports that the pain worsens when she lifts her baby, particularly during feeding or carrying. On examination, there is tenderness over the radial styloid, and the pain is exacerbated by thumb movement. What is the most likely diagnosis?

A) Dupuytren's contracture.

B) Carpal tunnel syndrome.

C) Osteoarthritis.

D) Rheumatoid arthritis.

E) De Quervain’s tenosynovitis.

**Answer: E) De Quervain's tenosynovitis.**

**Explanation:**

**De Quervain's tenosynovitis** is common in women during the postpartum period, likely due to the repetitive strain from lifting and holding the baby. It involves inflammation of the tendons at the base of the thumb near the radial styloid. The key clinical feature is pain and tenderness over the radial side of the wrist, often worsened by activities that involve gripping or lifting. This scenario is typical for De Quervain's, as postpartum women frequently experience this due to repeated hand use in caring for their newborn.

**Why not carpal tunnel syndrome?**

**Carpal tunnel syndrome** presents with numbness, tingling, and pain in the thumb, index, and middle fingers due to compression of the median nerve. It typically affects the volar aspect of the wrist, not the radial styloid area, and the symptoms are often worsened by activities like typing or during the night. Since this patient's pain is localised to the radial side of the wrist and exacerbated by thumb movement rather than median nerve compression symptoms, carpal tunnel syndrome is less likely.

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